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A new species of *Microcharmus* Lourenço, 1995 (Scorpiones: Microcharmidae) from extremely dry areas of Central-West Madagascar

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Abstract

A new species of humicolous buthoid scorpion belonging to the genus *Microcharmus* is described on the basis of a single specimen collected in a dry bush formation in the region of Cap Saint André, Central-West Madagascar. The habitat of the new species represents one of the driest environments documented for the genus. New considerations are proposed on the ecology and biogeography of this endemic Malagasy group of scorpions, which appears to be restricted to dry and wet forest formations in the northern and northwestern portions of the island. Some comments are also added about their possible evolution of these scorpions from endogenous to epigean environments.

Keywords: Scorpion, Microcharmidae, *Microcharmus*, Madagascar, new species, distribution pattern, endogenous and epigean environments.

Introduction

As already discussed in some previous publications, humicolous scorpions living in organic soil are rare in most regions of the world (Lourenço, 1998, 2003, 2004, 2005; Lourenço *et al.*, 2006, 2019). In Madagascar, the most characteristic soil-dwelling scorpions belong to the family Microcharmidae Lourenço which is represented by two genera *Microcharmus* Lourenço, 1995 and *Neoprotobuthus* Lourenço, 2000. The genus *Microcharmus* was originally described in recent years (Lourenço, 1995), based on a new

species *Microcharmus cloudsleythompsoni* Lourenço, 1995 collected by the late Professor Jacques Millot in the region of Zangoa in the northwest of Madagascar in 1947. This first specimen collected by J. Millot was likely obtained using an extraction method, though this is not specified in the labels. In this same year of 1947, Millot also collected a second specimen on the island of Nosy Be, later described as *Microcharmus jussarae* (Lourenço, 1996a). This species was apparently collected under a piece of bark on the ground. Two additional species, *Microcharmus hauseri* Lourenço, 1996 and *Microcharmus sabineae* Lourenço, 1996 were described in this same period, from Nosy Be and Marojejy, respectively. In both cases, the specimens were obtained with the use of Berlese type extractions methods (Lourenço, 1996a,b).

In the subsequent years, two other genera were described within the family Microcharmidae, *Neoprotobuthus* Lourenço, 2000 and *Ankaranocharmus* Lourenço; 2004 (Lourenço, 2000, 2004). Nevertheless, the validity of the genus *Ankaranocharmus* was later questioned, and it was placed in the synonymy with *Microcharmus* (Lourenço *et al.*, 2006).

Following the initial descriptions of species in the family Microcharmidae, which began in 1995 (Lourenço, 1995, 1996a,b), the slow pace of new descriptions was largely associated with the difficulties of collecting these scorpions. They are difficult to locate using ordinary methods such as rock-rolling, pitfall traps, or even the use of UV light, primarily due to their minute size, possible low vagility, and highly cryptic behaviour. Only through the efforts of several systematic invertebrate surveys, led by a number of field biologists across different sites in Madagascar, was a more comprehensive understanding of this scorpion group achieved (Lourenço *et al.*, 2006, 2019).

By the time of the first major revision of the group (Lourenço *et al.*, 2006), seven species were recognized in the genus *Microcharmus*, while *Neoprotobuthus* remained monotypic. However, subsequent descriptions since 2006 have significantly increased the number of known *Microcharmus* species. In account of several biogeographical considerations, two previously recognized subspecies are elevated to the rank of species (Lourenço *et al.*, 2019).

In this paper, one new species is described, bringing the total number of recognized species in the genus to 20. Biogeographical, ecological and eco-physiological aspects are also discussed in relation to this family. Since the position of the family Microcharmidae was clearly defined in a previous paper, it will not be further discussed here (Lourenço *et al.*, 2019).

The evolution of scorpions from endogenous to epigean environments

As previously, humicolous scorpions are globally rare. The first precisely reported case was *Akentrobuthus leleupi*, a buthid found in the forests of Kivu Province, Congo, and described by Lamoral (1976). Shortly before Lamoral's publication, Vachon (1974) described a new genus and species, *Lychasioides amieti*, from the forest of Otomoto, in Cameroon. According to the collector, this species, was found in organically rich soil and was therefore considered a humicolous element (Vachon, in litt.). Subsequently, additional genera and species of true humicolous scorpions were described from Madagascar and tropical Americas, such as *Microcharmus*, *Ananteris*, and *Microananteris* (Lourenço, 2004, 2005, 2021). However, humicolous scorpions' species from tropical Americas appear to be even rarer than those found in Madagascar.

A number of morphological traits found in humicolous scorpions suggest possible convergences in their evolutionary processes. These comprise small size, the persistence of neotenic structures in adults, and, in most instances, a humicolous lifestyle and cryptozoic behaviour. Their ecology and biology remain poorly understood, but

inventories conducted over nearly 50 years have revealed that the number of species is significantly greater than initially expected. However, most species remain extremely rare and have highly limited and patchy distributions.

A noticeable particularity observed in most humicolous species is the absence of juvenile forms in collections based on overturning rocks, the use of ultra-violet light, and pit-fall traps. Only extraction methods, such as Berlese, Winkler and Kempson, have successfully yielded juvenile specimens. Extraction methods have been used more extensively in Madagascar than in the tropical Americas and have resulted in the collection of juvenile forms from several species. This raised the question: Why have juvenile forms of these cryptozoic, but in some cases epigean, species have only been found with the use of extraction methods? This issue was previously addressed for some tropical American species (Lourenço, 2005), and is revisited here.

Scorpion adapted to terrestrial environments between the Carboniferous and Triassic periods (Jeran, 2001; Lourenço & Gall, 2004). It has been suggested that transitional forms may have existed during this time, although they are difficult to identify (Jeran, 2001). Early terrestrial forms were most likely unable to survive in extreme environments such as savannahs and deserts, which today are colonized by numerous species of scorpions. Depending on their degree of adaptation to life on land, different types of soil would have been utilized at various stages of the evolution and adaptation.

The evaporating power of the air is the most important physical factor of the environment affecting the distribution of cryptozoic animals. Small creatures have a large surface relative to their mass; making water conservation their prime physiological challenge (Cloudsley-Thompson, 1967, 1988; Little, 1983). The majority of cryptozoic animals are restricted to moist conditions, though excessive moisture leading to water logging is also unsuitable. It is probable that the evolutionary transition of many invertebrates from aquatic to terrestrial life occurred via the soil, where aerial respiration does not necessarily lead to desiccation (Cloudsley-Thompson, 1967, 1988; Little, 1983).

The present eco-physiological characteristics of several primitive scorpion lineages suggest that these groups were originally composed exclusively of soil dwellers. Over evolutionary time, adult forms learned to explore the epigean environment, while juveniles remained endogean. This pattern is frequently observed in insects but is generally unknown among scorpions (Wallwork, 1970; Gobat *et al.*, 2003). Such partial adaptation could explain the absence of juveniles outside the soil environment.

Material and Methods

Illustrations and measurements were produced using a Wild M5 stereo-microscope with a drawing tube and ocular micrometer (at 25 and 50x). Measurements follow Stahnke (1970) and are given in mm. Trichobothrial notations follow Vachon (1974, 1975), and morphological terminology mostly follows Vachon (1952), Hjelle (1990). The holotype specimen used in this taxonomic contribution is now deposited in the Muséum national d'Histoire naturelle, Paris (MNHN).

Taxonomy

Family **Microcharmidae** Lourenço, 1996
Genus ***Microcharmus*** Lourenço, 1995

Figs. 1-2. *Microcharmus aridus* sp. n. Female holotype. Habitus. 1. dorsal and 2. ventral aspects.

Description of one new species

Microcharmus aridus sp. n. (Figs. 1-5)

Type Material: Madagascar, Cap Saint André, N of Besalampy. In dry bush, collected with the use of Berlese extraction from deep organic soil (J.-M. Betsch), X/1972 1 female holotype. Type deposited in the Muséum, national d'Histoire naturelle, Paris, France.

Etymology: The specific name defines the arid and dry environment in which the new species was collected.

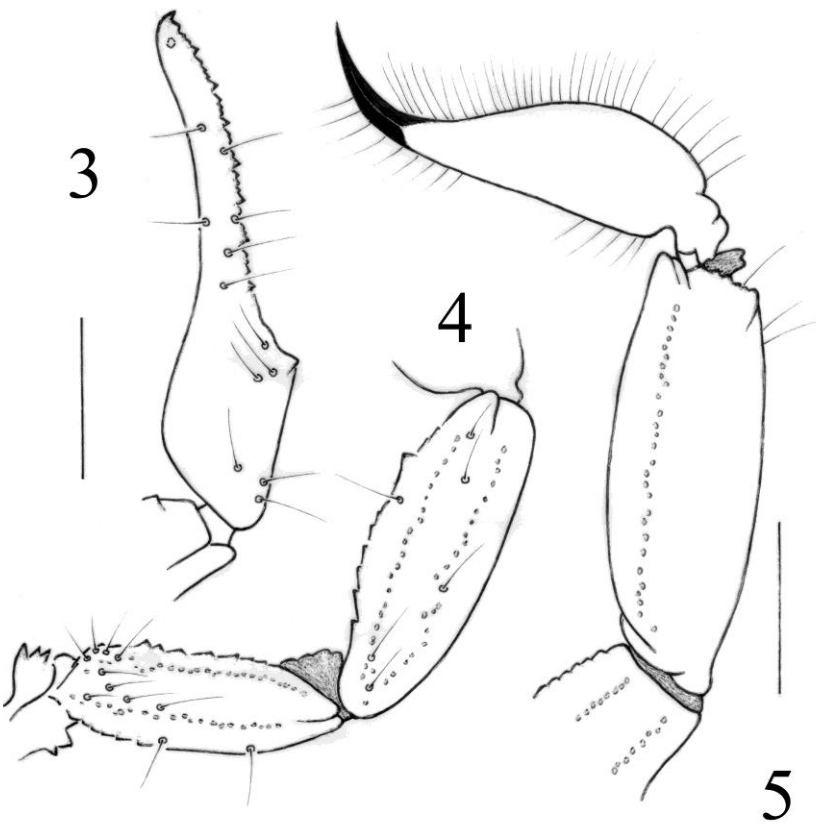
Diagnosis: Scorpions of small size when compared with most species of the genus *Microcharmus* with 8.59 mm total length for the female holotype. Only two previously described species showed such small values: *Microcharmus confluenciatus* Lourenço, Goodman & Fisher, 2006 and *Microcharmus violaceous* Lourenço, Goodman & Fisher, 2006 with respectively 8.10 and 8.30 mm (Lourenço *et al.*, 2006). It is quite possible however, that the studied specimens were not full adults. General colouration yellow with weakly marked variegated spots over body and appendages. Carinae and granulations moderately marked on body and appendages. Pectines with 10-10 teeth.

Relationships: The new species shows some affinities with *Microcharmus andrei* Lourenço, Waeber & Wilmé, 2019 and to a less extend to *Microcharmus variegatus* Lourenço, Goodman & Fisher, 2006; it can however be distinguished from these species by a much less intense pigmentation on the body and appendages. In particular (i) a ventral aspect totally pale-yellow, without spots, (ii) pedipalps almost spotless with only some pale minute spots on femur and patella, (iii) chelicerae yellow but much less spotted than in the other species.

Description based on female holotype (Figs. 1-2).

Colouration. Basically, yellow to pale yellow with weakly marked variegated spots over the body and appendages. Carapace, tergites and metasomal segments with light variegated spots; telson and vesicle without spots. Pedipalp femur and patella inconspicuously spotted; chela hand yellow without spots; fingers pale yellow; chelicerae yellow with variegated spots on its anterior third; fingers and teeth yellow with some spots; venter pale yellow without spots; legs more heavily spotted than pedipalps.

The characters, colour and pigmentation are the most conspicuous external ones in scorpions, especially amongst buthoids. These are largely used in the taxonomy of several groups of micro-buthoids. It is important to distinguish two aspects of colouration. One is the colour of the cuticle itself, which can vary from clear (transparent) to black. Among some scorpions, colouration changes with the age. Juvenile stages of several species are variegated yellow, whereas the adults are black. A second type of colouration is due to the presence of sub-cuticular pigments, which form a variety of configurations or etched-like patterns over the body, pedipalps, and chelicerae. This second type of pigmentation does not normally change with age, but it can be masked by sclerification (Lourenço, 1983; Lourenço & Cloudsley-Thompson, 1996). In the case of microbuthoid scorpions, colour and pigments are very useful characters for species identification, as is the case of several scorpion genera such as *Ananteris* (Lourenço, 1982), *Microananteris* (Lourenço, 2021) and *Tityobuthus* (Lourenço, 1996a). In the present study, the diagnosis and description of the new taxa is largely based on the pigmentation patterns.



Figs. 3-5. *Microcharmus aridus* sp. n. Female holotype. 3-4. Trichobothrial pattern. 3. Chela, dorso-external aspect. 4. Femur and patella, dorsal aspect. 5. Metasomal segment V and telson, lateral aspect. (Scale bars: 0.5 mm).

Morphology. Carapace with weakly marked granulation; anterior margin with a moderate concavity. Carinae weak; furrows inconspicuous. Median ocular tubercle located distinctly on the anterior third of the carapace; median eyes separated by a little more than one ocular diameter. Three pairs of lateral eyes. Sternum pentagonal. Mesosoma: tergites with a thin granulation, almost smooth. Median carina weak in all tergites. Tergite VII pentacarinate. Venter: genital operculum divided longitudinally, each plate with a more or less oval to semi-triangular shape. Pectines moderate to small: pectinal tooth count 10-10 for female holotype; basal middle lamellae of the pectines not dilated; fulcra absent. Sternites without granulations, smooth, and with small oval to round spiracles; VII equally without granulations and with vestigial carinae. Metasomal segments I to III with ten carinae, weakly crenulate; segment IV with eight carinae and ventral carinae vestigial; intercarinal spaces weakly granular to smooth. Segment V rounded with five carinae. Telson with an elongated pear-shaped structure, smooth with strong setation; aculeus short and weakly curved; subaculear tooth absent. Cheliceral dentition characteristic of buthoid (Vachon, 1963); fixed finger with two strong basal teeth; movable finger with two very weak but fused basal teeth; ventral aspect of both finger and manus with dense, long setae. Pedipalps: femur pentacarinate; patella with vestigial carinae; internal face of patella with a few spinoid granules; chela without carinae or granulations, smooth. Fixed and movable fingers with seven almost linear rows of granules; two accessory granules present at the base of each row; extremity of fixed and movable fingers with one long and sharp denticle. Trichobothriotaxy; orthobothriotaxy A-α (Vachon, 1974, 1975). Legs: tarsus with very numerous fine ventral median setae. Pedal spurs reduced; tibial spurs vestigial on legs III and IV.

Morphometric measurements (in mm) of the female holotype.

Total length, 8.59. Carapace: length, 1.14; anterior width, 0.74; posterior width, 1.14. Mesosoma length, 2.21. Metasomal segments I: length, 0.54; width, 0.67. II: length, 0.61; width, 0.54. III: length, 0.67; width, 0.54. IV: length, 0.81; width, 0.54. V: length, 1.34; width, 0.47; depth, 0.41. Telson length, 1.27; vesicle: width, 0.41; depth, 0.34. Pedipalp: femur length, 0.94, width, 0.34; patella length, 1.14, width, 0.41; chela length, 1.61, width, 0.41, depth, 0.41; movable finger length, 1.08.

Distribution: Only known from the type locality.

Biogeography and ecology

Scorpions of the family Microcharmidae have retained an ancestral habit of dwelling on the upper humid soil surface (Lourenço *et al.*, 2016, 2019). The genus *Microcharmus* occurs in humid, subhumid, and dry forests spanning bioclimates from perhumid to nearly subarid (Cornet, 1974). This basal behaviour has likely facilitated their adaptation to the diverse environments found in northern Madagascar.

The new species is described from a locality within the known range of the family (Fig. 6; map). The Cap Saint-André region is extremely dry but retains a western dry forest, the Bokarano Forest, situated behind sand dunes and mangroves at low altitudes. The region is bounded to the south by the Sambao River, a right-bank tributary of the Maningoza and the largest tributary in that watershed. This river originates beneath the western cliff of the Kelifely Plateau at altitudes exceeding 700 m (Fig. 6; map). The Bokarano Forest was crossed by an extreme cyclone in March 1927, and was partially the same year (Célérier & Cholley, 1929; Decary, 1932), though it certainly recovered at least partly by the time of the J.-M. Betsch’s visit in October 1972; after a major fire, dry forests in western Madagascar take decades to recover (Rabemananjara *et al.*, 2025). This

forest features numerous fire-resistant *Bismarckia nobilis* palms, as well as shrubs and stately trees-such as *Erythrophleum couminga*, which can reach about ten meters in height (Capuron, 1966).

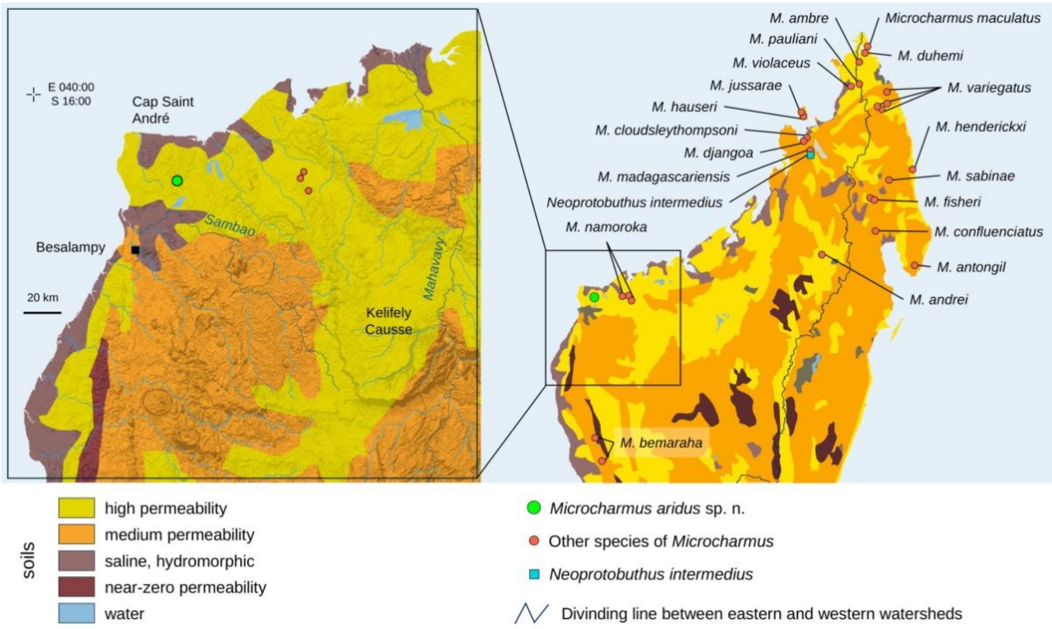


Fig. 6. Maps with the distribution of the 21 species included in the family Microcharmidae, with the type locality of *Microcharmus aridus* sp. n. in the region of Cap Saint-André (permeability of soils is illustrated on both maps).

Fig. 7. Dry forest formation from the Mandrozo Reserve, located about 140 km from Cap St. André. This vegetation cover is similar to the one found in Cp. St. André (photo by R. R. L. Arison).

In the causse (group of limestone plateaux) of Kelifely, thin calcimorphic soils often exhibit high permeability due mainly to fissures and fractures in the parent rock. As a result, areas like the region of Cap Saint-André are characterized by highly permeable soils. The species of Microcharmidae occurring in dry forests of the west and north of the family range are mostly encountered on highly permeable soils, whereas species from subhumid and humid forests occur on formations with moderately permeable soils. While humid and subhumid forests receive rain for seven to twelve months of the year, the forests at Cap Saint-André experience scarcely four rainy months. In natural forests, leaf litter accumulates to form a thick humus layer that consistently promotes water infiltration (Fig. 7).

The combination of high soil permeability and a well-developed humus layer creates favourable microhabitats for humicolous scorpions. These conditions facilitate effective drainage and water retention while providing a stable, humid substrate. Such habitats are ideal for a humicolous lifestyle-which is reflected in the cryptic, soil-dwelling behaviour of this new species-and may explain why juveniles are rarely captured by conventional methods, being more likely to remain within the organic soil layer.

The remarkable diversity in morphology and ecology among Microcharmidae appears closely linked to specific soil and vegetation characteristics. Continued exploration in dry forest regions, particularly those with highly permeable soils and rich humus layers, may uncover additional isolated populations. This could further illuminate the evolutionary transition from endogenous (soil-bound) to epigean (surface-exploring) environments among these cryptic scorpions.

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Microcharmus aridus **Lourenço & Wilmé, 2025**
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A new species of *Compsobuthus* Vachon, 1949 from Saudi Arabia (Scorpiones: Buthidae)

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Abstract

A new species of *Compsobuthus* Vachon, 1949 is described on the basis of one female and three males collected in Al Buraikah, Al Ula Governorate, north of Al Madinah Province, in north-western Saudi Arabia. This new scorpion taxon represents the 57th known species of the genus *Compsobuthus* and the 8th reported from Saudi Arabia. A geographical distribution map of the type localities of the *Compsobuthus* species occurring in the region is presented.

Keywords: Scorpion, *Compsobuthus*, taxonomy, new species, Saudi Arabia.

Introduction

As already outlined in a recent publication (Ythier & Lourenço, 2023), since the first attempt by Vachon (1979) to study the entire scorpion fauna of Saudi Arabia, and except the important work of Hendrixson (2006) on Buthid scorpions of this country, the scorpion fauna of Saudi Arabia has remained poorly studied in comparison to those of the surrounding Middle Eastern countries, mainly Yemen, Oman, Jordan, Israel and Palestine. However, efforts were made by some authors during the last 15 years to clarify the taxonomy and distribution of several species occurring in Saudi Arabia (*e.g.* Al-Asmari *et al*., 2007, 2009a,b, 2013; El-Hennawy, 2009, 2014; Desouky & Alshammari, 2011; Lowe *et al*., 2014, 2019; Alqahtani *et al*., 2019, 2023; Kovarik *et al*., 2020, 2022; Abu Afifeh *et al*., 2021, 2023a,b; Al-Qahtani & Badry, 2021; Aloufi *et al*., 2022; Alqahtani, 2022; Al-Qahtni *et al*., 2023; Ythier & Lourenço, 2023). Despite this,

taxonomic confusion still exists for a number of species, including those belonging to the genus *Compsobuthus* Vachon, 1949.

Seven *Compsobuthus* species are currently recognized to occur in Saudi Arabia: *C. manzonii* (Borelli, 1915), *C. arabicus* Levy, Amitai & Shulov, 1973, *C. longipalpis* Levy, Amitai & Shulov, 1973, *C. pallidus* Hendrixson, 2006, *C. setosus* Hendrixson, 2006, *C. khaybari* Abu Afifeh, Aloufi & Al-Saraireh, 2021 and *C. mahazat* Ythier & Lourenço, 2023. The new species described in this work, *C. henrii* sp. n., has been collected in Al Buraikah, Al Ula Governorate, north of Al Madinah Province, and can be distinguished from these species by a number of characters. The number of *Compsobuthus* species currently recognized in Saudi Arabia is now raised to eight and the total number of scorpion species reported from the country is increased to 37.

Material and Methods

Illustrations and measurements were made using a Motic SMZ-171 stereomicroscope with an ocular micrometer. Habitus photographs were made with a Canon EOS RP and Adobe Photoshop software. The distribution map was prepared by using Google Maps and Adobe Photoshop software. Measurements follow Stahnke (1970) and are given in mm. Trichobothrial notations follow Vachon (1974) and morphological terminology mostly follows Vachon (1952) and Hjelle (1990). Specimens studied herein are deposited in the MNHN (Muséum national d'Histoire naturelle, Paris, France) and EYPC (Eric Ythier Private Collection, Romanèche-Thorins, France).

Taxonomic treatment

Family **Buthidae** C.L. Koch, 1837

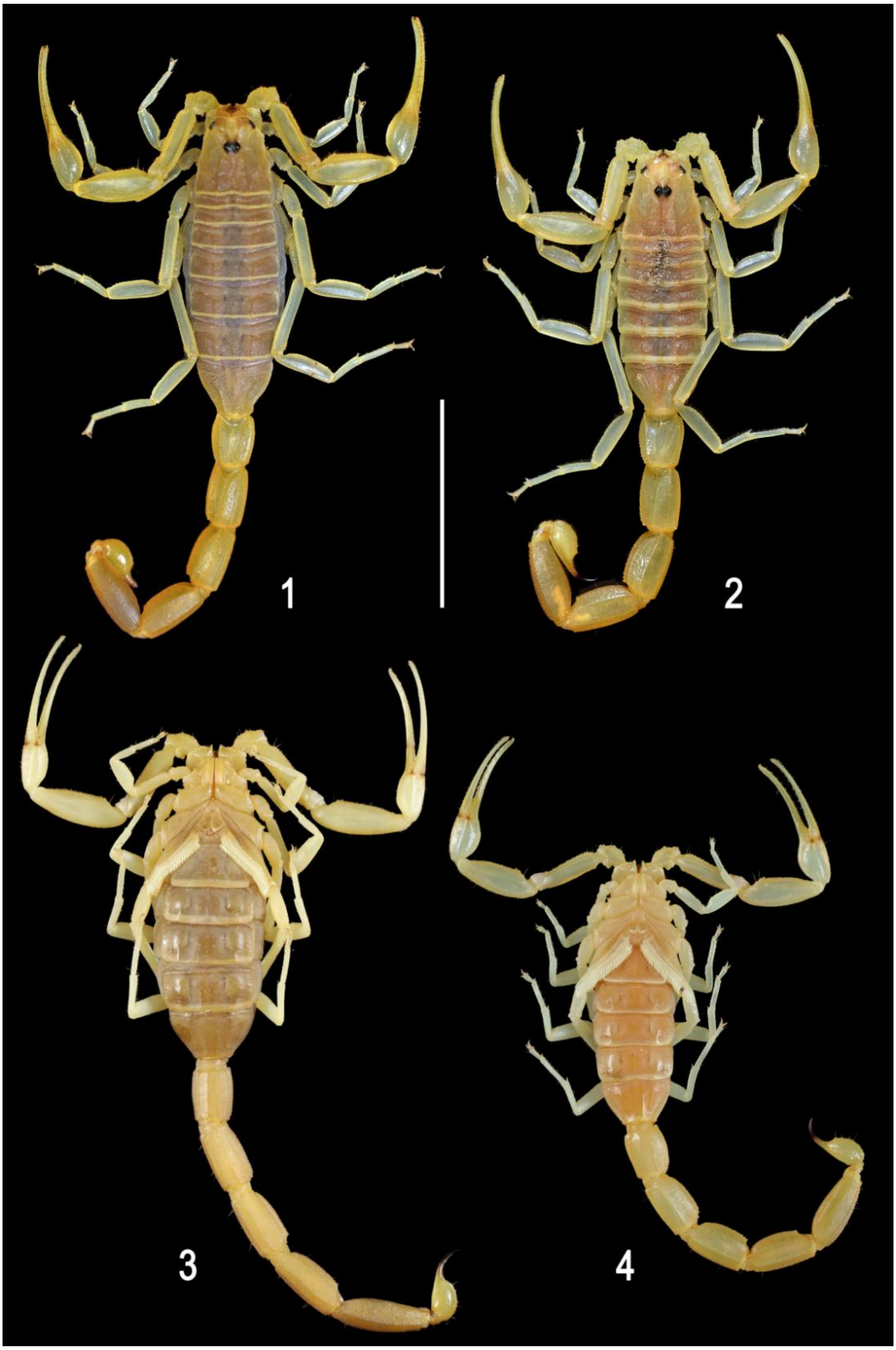
Genus ***Compsobuthus*** Vachon, 1949

Composition of the genus ***Compsobuthus*** in Saudi Arabia (in order of description):
- *C. manzonii* (Borelli, 1915)
- *C. arabicus* Levy, Amitai & Shulov, 1973
- *C. longipalpis* Levy, Amitai & Shulov, 1973
- *C. pallidus* Hendrixson, 2006
- *C. setosus* Hendrixson, 2006
- *C. khaybari* Abu Afifeh, Aloufi & Al-Saraireh, 2021
- *C. mahazat* Ythier & Lourenço, 2023
- *C. henrii* sp. n.

Compsobuthus henrii sp. n. (Figs. 1-13)

Type material. Saudi Arabia, Al Madinah Province, Al Ula Governorate, Al Buraikah (البريكة), 27°19'54.0"N, 37°47'31.1"E, elevation 1108 m, 09/III/2025 (H. Ullrich & A. Ullrich). Type material composed of 1 female holotype, 3 males paratypes (2 adults and 1 pre-adult). Female holotype and 1 adult male paratype deposited in the MNHN; 2 males paratype (1 adult and 1 pre-adult) deposited in the EYPC.

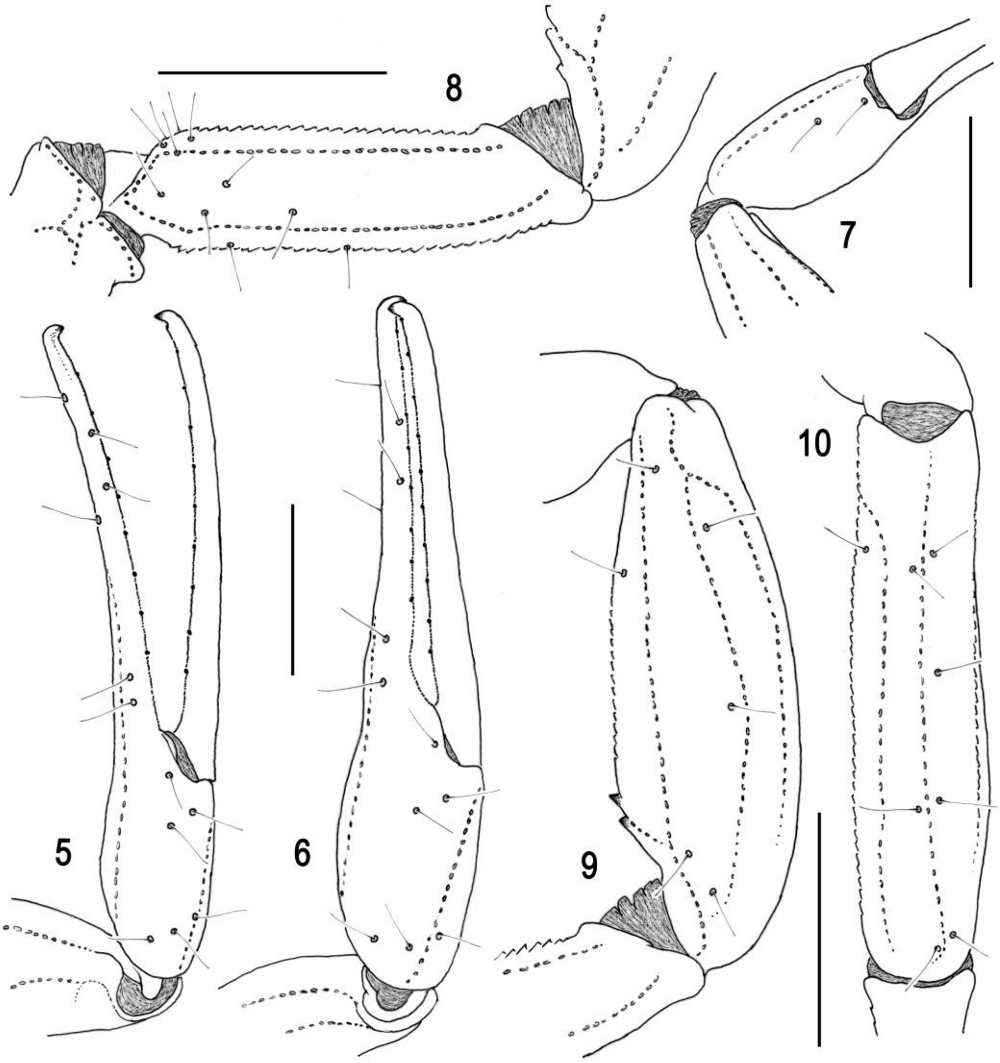
Etymology. Patronym in honour of Henri Ullrich, Munich, Germany, one of the collectors of the new species.



Figs. 1-4. *Compsobuthus henrii* sp. n., habitus. 1,3. ♀ holotype. 2,4. ♂ paratype. 1-2. dorsal aspect, live specimens (photos Tobias J. Hauke). 3-4. ventral aspect, preserved specimens. (Scale bar: 1 cm).

Diagnosis. Scorpion of medium size when compared to other known species of the genus in Saudi Arabia, with a total length of 35.24 mm in female and 31.14 to 31.95 in males.

General colouration yellowish to pale yellow without spots; only some weak fuscosity barely visible on interocular triangle of carapace and ventral carinae of metasomal segments IV-V. Sternites and ventral surface of metasomal segments with only few sparse setae. Pectines with 20-21 teeth in female, 22-23 teeth in males. Metasomal segments I-V with 10-10-10-8-5 carinae; intermediate carinae complete on I, incomplete on II-III, absent on IV. Pedipalp chela slender, with fingers moderately elongated, straight in female, scalloped in male with a proximal gap between fingers when closed. Dentate margin on movable finger composed of 10 almost linear rows of granules, with 9-10 inner accessory granules, outer accessory granules absent (‘*acutecarinatus’* group).



Figs. 5-10. *Compsobuthus henrii* sp. n., trichobothrial pattern. 5,7-10. ♀ holotype. 6. ♂ paratype. 5-7. Chela. 5-6. External aspect. 7. Ventral aspect. 8. Femur, dorsal aspect. 9-10. Patella. 9. Dorsal aspect. 10. External aspect. (Scale bars: 2 mm).

Description based on female holotype and males paratypes.

Colouration (in alcohol). Generally yellowish to pale yellow without spots. Prosoma: carapace yellowish with some weak fuscosity barely visible on the interocular triangle; eyes surrounded by black pigment. Mesosoma: tergites yellowish. Metasomal segments yellowish with some weak fuscosity on ventral carinae in segments IV-V; vesicle

yellowish; aculeus yellowish at the base and reddish at the tip. Venter yellowish; pectines paler. Legs pale yellow. Chelicerae pale yellow, with teeth pale red. Pedipalps pale yellow overall; rows of granules on the dentate margins of chela fingers pale red.
Morphology. Prosoma: anterior margin of carapace weakly emarginate. Carapace carinae moderately developed; anterior median, central median, posterior median and central lateral moderately marked; posterior median carinae terminating distally in a small spinoid process that extends beyond the posterior margin of the carapace. Intercarinal spaces weakly granular; almost smooth centrally. Median ocular tubercle anterior to the centre of the carapace; median eyes separated by one (in male) to slightly less than one (in female) ocular diameter. Five pairs of lateral eyes. Mesosoma: tergites I-VI tricarinate. Lateral carinae on I-VI strongly marked; each carina terminating distally with a spinoid process that extends strongly beyond the posterior margin of tergite. Median carinae on I weak; on II-VI moderate to strong, crenulate; terminating distally on each segment with a spinoid process that extends slightly beyond the posterior margin of the tergite. Tergite VII pentacarinate, with lateral pairs of carinae moderate to strong; median carinae present on proximal two-thirds, moderate. Intercarinal spaces with minute granulation, coarser laterally. Sternites: lateral carinae absent from sternites III-V, vestigial on VI, weak (in male) to moderate (in female) and finely crenulate on VII. Submedian carinae absent from sternites III-V, vestigial on VI, weak on VII. Intercarinal spaces smooth, with only few sparse setae. Pectines: pectinal tooth count 20-21 in female holotype, 22-23 in male paratypes. Metasoma: segments I-III with ten carinae, IV with height carinae, crenulate; intermediate carinae complete on I, incomplete on II-III, absent on IV. Segment V with five carinae; ventromedian carinae moderate to weak. Dorsal furrows of all segments weakly developed; intercarinal spaces weakly granular, with only few sparse setae. Telson weakly granular with ventral and latero-ventral carinae; aculeus shorter than the vesicle; subaculear tubercle vestigial, rhomboid. Chelicerae with two denticles at the base of the movable finger, partially fused (Vachon, 1963). Pedipalps: trichobothrial pattern orthobothriotaxic, type A (Vachon, 1974); dorsal trichobothria of femur in β (beta) configuration (Vachon, 1975). Femur pentacarinate; all carinae moderately crenulate. Patella with eight carinae; all carinae moderately marked; dorsointernal carinae with one spinoid granule. Chela slender with length/width ratio 6.65 in female and 5.0 in male; fingers moderately elongated, straight in female, scalloped in male with a proximal gap between fingers when closed; all carinae moderately marked. Dentate margin on movable finger composed of 10 almost linear rows of granules, with 9-10 inner accessory granules, outer accessory granules absent (or only on 1-3 proximal rows); dentate margin on fixed finger composed of 9 almost linear rows of granules, with 9-10 inner accessory granules, outer accessory granules absent (or only on 1-3 proximal rows). Legs: ventral aspect of tarsi with two rows of setae. Tibial spurs present on legs III and IV, moderate. Pedal spurs moderate on all legs.

Morphometric values (in mm) of female holotype and one male paratype. Total length (including telson) 35.24/31.95. Carapace: length 4.00/3.14; anterior width 1.90/1.52; posterior width 4.10/3.52. Mesosoma length 10.19/9.05. Metasomal segment I: length 2.67/2.57, width 2.00/2.14; II: length 3.14/3.05, width 1.90/1.90; III: length 3.33/3.19, width 1.81/1.81; IV: length 3.81/3.52, width 1.71/1.81; V: length 4.29/4.10, width 1.71/1.71, depth 1.62/1.62. Telson length 3.81/3.33. Vesicle: width 1.29/1.24, depth 1.24/1.24. Pedipalp: femur length 4.29/3.71, width 1.05/1.00; patella length 4.86/4.24, width 1.57/1.43; chela length 7.71/6.90, width 1.16/1.38, depth 1.19/1.33; movable finger length 5.62/4.71.

Figs. 11-14. *Compsobuthus* species, alive. 11-13. *Compsobuthus henrii* sp. n. 11-12. ♀ holotype. 11. Natural light. 12. UV light. 13. ♂ paratype. 14. *Compsobuthus khaybari* ♀ collected 70 km south of the type locality of *C. henrii* sp. n. (photos Tobias J. Hauke).

Relationships. *Compsobuthus henrii* sp. n. shows some morphological convergences with *Compsobuthus jordanensis* Levy, Amitai & Shulov, 1973 described from north-western Jordan. The new species can however be distinguished notably by the following main features: (i) pectines with 20-21 and 22-23 teeth in female and male, respectively (lower pectinal tooth count with 14-19 and 20-22 teeth in female and male of *C. jordanensis*, respectively); (ii) dentate margin of fixed finger with 9 rows of granules (10 in *C. jordanensis*); (iii) male pedipalp chela finger scalloped (straight in *C. jordanensis*); (iv) pedipalp chela with length/width ratio 6.65 in female and 5.0 in male (less slender in *C. jordanensis* with length/width ratio 5.41 in female and 4.50 in male); (v) a significantly different geographical distribution.

Compsobuthus henrii sp. n. can also be distinguished from the geographically closest species *Compsobuthus khaybari* Abu Afifeh, Aloufi & Al-Saraireh, 2021, described from approximately 230 km south-east of the type locality of the new species (Fig. 15) and recently collected at approximately 70 km south of the type locality (Fig. 14), notably by the following main features: (i) general colouration yellowish to pale yellow without spots (darker colouration in *C. khaybari*, with marked dark pigmentation on metasomal segment V); (ii) pectines with 20-21 and 22-23 teeth in female and male, respectively (lower pectinal tooth count with 17-17 and 20-22 teeth in female and male of *C. khaybari*, respectively); (iii) dentate margin on movable finger without outer accessory granules, *i.e.* '*acutecarinatus*' group (present in *C. khaybari*, *i.e.* '*werneri*' group); (iv) pedipalp chela with length/width ratio 6.65 in female and 5.0 in male (less slender in *C. khaybari* with length/width ratio 4.90 in female and 4.54 in male); (v) sternites and ventral surface of metasomal segments with only few sparse setae (numerous setae in *C. khaybari*).

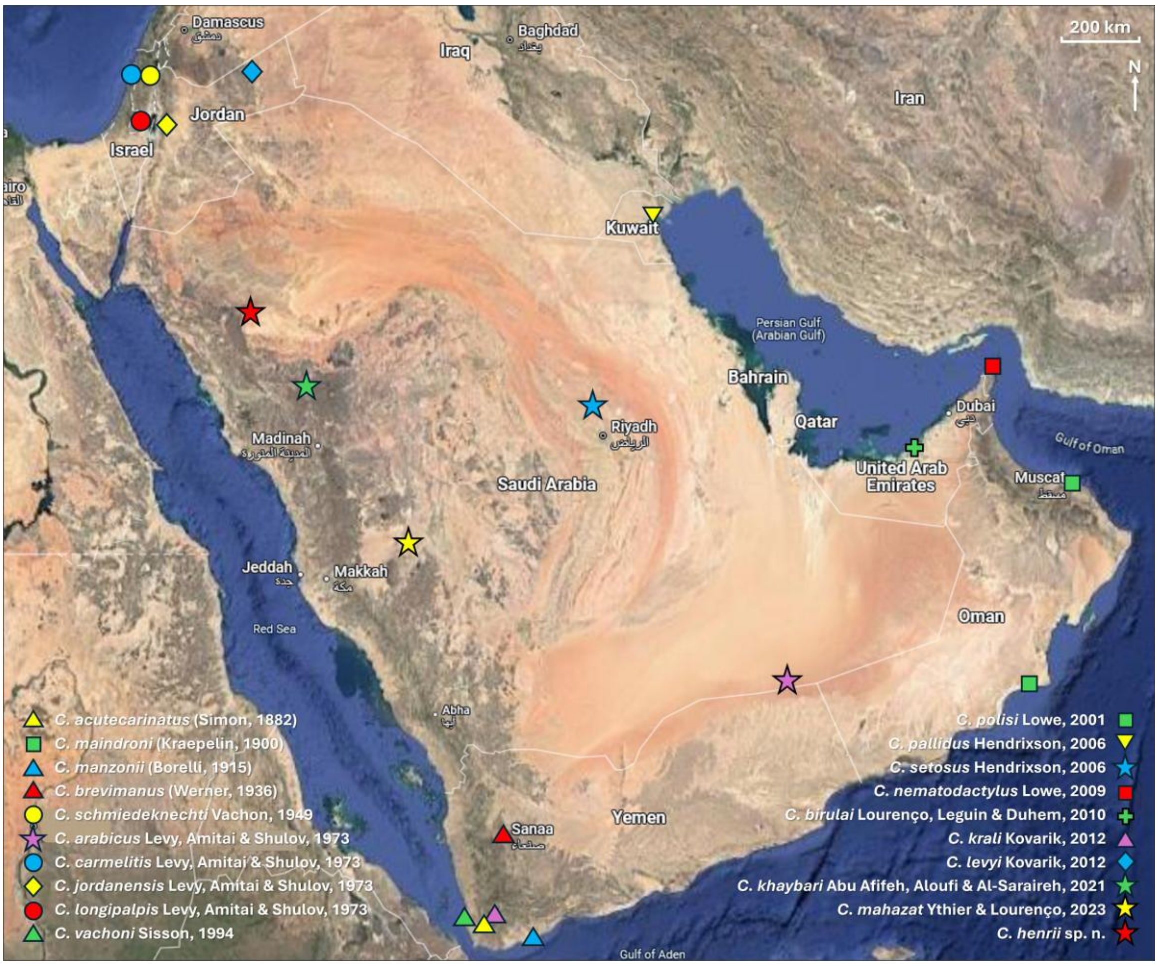


Fig. 15. Map of the Arabian Peninsula showing the type localities of the *Compsobuthus* species occurring in Saudi Arabia (star), Yemen (triangle), Oman (square), United Arab Emirates (cross), Kuwait (inverted triangle), Jordan (rhombus) and Israel/Palestine (circle).

Finally, the new species can be distinguished from the other species occurring in Saudi Arabia, notably by the following main features: (i) total length 31.1-35.2 mm (smaller in *C. arabicus*, *C. mahazat*, and *C. setosus* with 21-29 mm, 24.4 mm, and 28.7 mm, respectively; larger in *C. longipalpis* with 40-50 mm); (ii) general colouration yellowish to pale yellow without spots (darker colouration in *C. manzonii* and marked dark pigmentation on metasomal segment V in *C. longipalpis*); (iii) pectines with 20-21 and 22-23 teeth in female and male, respectively (lower pectinal tooth count in *C. arabicus* with 9-13 and 13-16 teeth in male and female, respectively, in *C. pallidus* with 15-16 and 16-18 teeth in male and female, respectively, and in *C. setosus* with 15-17 teeth in female); (iv) dentate margin of fixed and movable fingers with 9-10 rows of granules, respectively (7-9 in *C. arabicus* and 13-14 in *C. longipalpis*); (v) dentate margin on movable finger without outer accessory granules, *i.e.* '*acutecarinatus*' group (present in *C. longipalpis* and *C. manzonii*, *i.e.* '*werneri*' group); (vi) male pedipalp chela finger scalloped (straight in *C. arabicus*, *C. longipalpis* and *C. mahazat*); (vii) pedipalp chela with length/width ratio 6.65 in female and 5.0 in male (less slender in *C. arabicus* with 5.11-5.61 in female and 4.74 in male, in *C. pallidus* with length/width ratio 5.70 in female and 4.48-4.90 in male, and in *C. manzonii* with 4.18 in male); (viii) sternites and

ventral surface of metasomal segments with only few sparse setae (numerous setae in *C. setosus* and *C. pallidus*).

Distribution and ecological characteristics of the type locality

The new species was collected under UV light near the small village of Al Buraikah along Road 375 in north-western Saudi Arabia. The type locality lies within the area known as the “Magnificent Rocks of Buraikah”, a striking geological formation in Al Madinah and Tabuk Provinces (Fig. 16). This landscape is dominated by prominent, rugged granite outcrops that rise sharply from a flat desert plain composed primarily of aeolian sands and alluvial gravels. These rocky structures form a complex mosaic of microhabitats, including shaded rock crevices, sandy pockets, and gravel beds.

The habitat is classified as hyper-arid, with annual precipitation typically below 50 mm and summer temperatures frequently exceeding 40°C. The environment supports a specialized arthropod fauna, including xerophilic insects and several scorpion species adapted to extreme desiccation and thermal fluctuations. The presence of sheltered rocky microhabitats among the Buraikah formations provides critical refugia for scorpions, particularly during daytime heat stress.

Fig. 16. Natural habitat of *Compsobuthus henrii* sp. n. in Al Buraikah, in the area of the “Magnificent Rocks of Buraikah”.

Notably, the site harbours sympatric populations of *Leiurus nigellus* Abu Afifeh, Aloufi & Al-Saraireh, 2023, *Buthacus* sp., *Scorpio* sp., and *Compsobuthus henrii* sp. n., each occupying distinct ecological niches within the same locality. Specimens were collected at night under unseasonably cool and windy conditions for this region and time of year. Ambient temperature during collecting was approximately 11°C, with persistent moderate to strong winds (estimated 25-35 km/h), which likely influenced the surface activity of nocturnal arthropods. Despite these suboptimal conditions, both *Leiurus nigellus* and the newly discovered *Compsobuthus henrii* sp. n. were actively observed on the surface, suggesting a degree of behavioural plasticity and tolerance to lower nighttime temperatures and wind exposure.

Acknowledgments

The authors are most grateful to Dr. Tobias J. Hauke (Munich, Germany) for the permission to use his photos of live specimens of *C. henrii* sp. n. and *C. khaybari*.

The second author (Alex Ullrich) would also like to take this opportunity to pass the following message on to his son Henri Ullrich, to whom the new species is dedicated:
"Lieber Henri,
Diese Art trägt deinen Namen, weil du mich auf so vielen meiner Wege begleitet hast – aufmerksam, lebendig und mit echtem Interesse. Ich bin stolz auf dich und dankbar für die Zeit, die wir gemeinsam verbringen. Du hast diese Ehrung verdient, und ich freue mich sehr, dir auf diese Weise etwas zurückgeben zu können.
Als Familie haben wir schon gemeinsam Compsobuthus ullrichi entdeckt – darum erfüllt es mich mit besonderem Stolz, dass nun ein weiterer Vertreter dieser Gattung eine Verbindung zu unserer Familie trägt.
Ich weiß, du wirst immer deinen eigenen Weg gehen – und es macht deine Mutter und mich glücklich und stolz, dich dabei begleiten zu dürfen.
Ich werde immer für dich da sein.
Dein Papa."

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Compsobuthus henrii **Ythier & Ullrich, 2025**

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On the morphology of *Orthochirus innesi* Simon, 1910 (Scorpiones: Buthidae) with some ecological observations

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Abstract

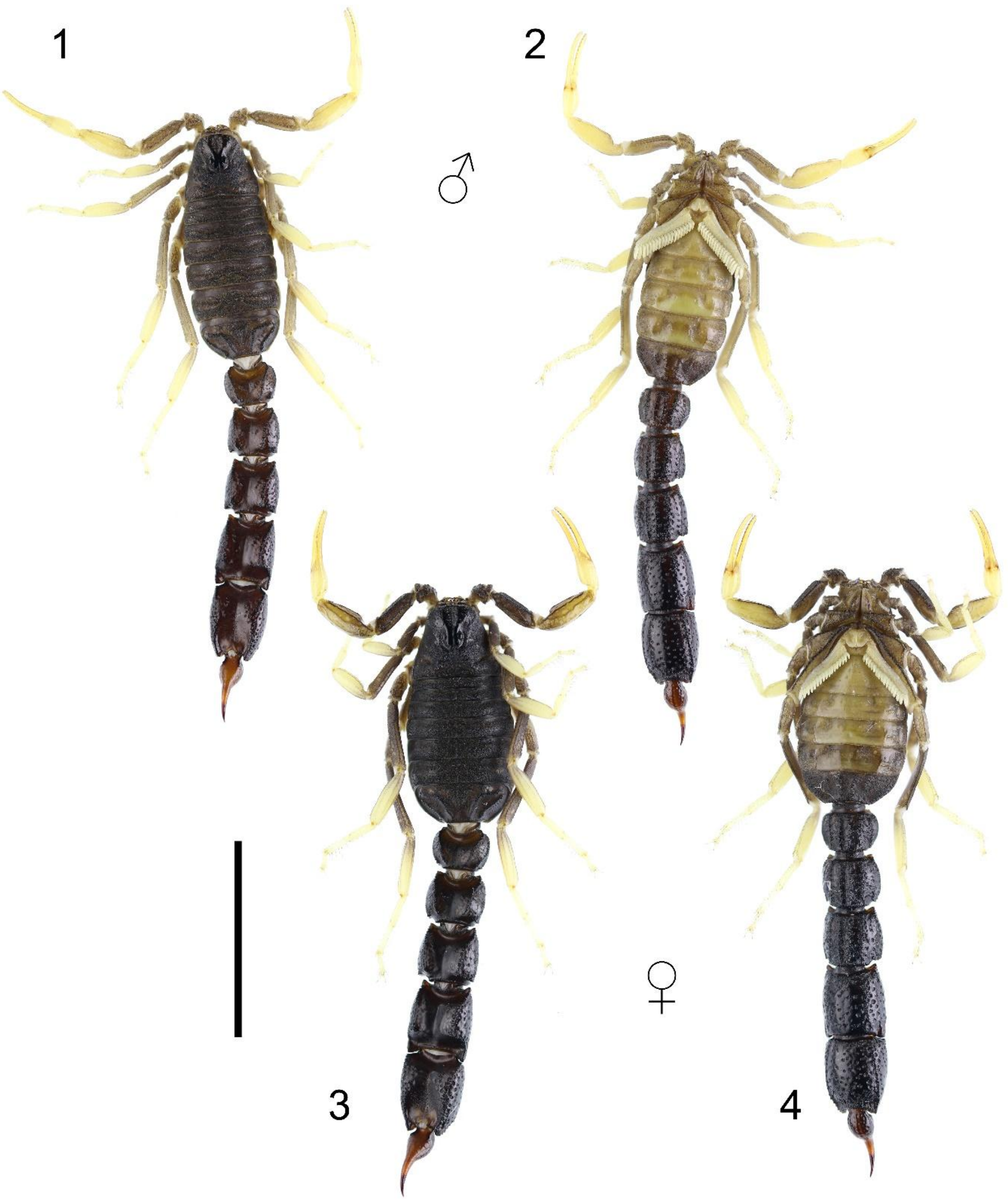
The scorpion *Orthochirus innesi* Simon, 1910 is redescribed based on specimens collected from its type locality, Cairo, Egypt. Detailed colour illustrations and UV-light-illuminated photographs are provided.

Keywords: Scorpiones, Buthidae, *Orthochirus innesi*, Egypt.

Introduction

Orthochirus innesi was originally described by Simon (1910) from Djebel Mokattam Hill, which is now within the city of Cairo. Although *O. olivaceus* (Karsch, 1881) and *O. aristidis* (Simon, 1882) were described earlier, many populations of *Orthochirus* detected in Africa have been labelled as *O. innesi*. Similarly, numerous populations found in Asia have been assigned to *O. scrobiculosus* (Grube, 1873) (Kovařík, 2004). Since many populations are still classified under the names *O. innesi* or *O. scrobiculosus*, their detailed descriptions, illustrations, and taxonomic positions are of great importance. *O. innesi* was redescribed by Vachon (1952) and later by Lourenço & Leguin (2011). More recently, *O. scrobiculosus* was thoroughly redescribed by Kovařík *et al.* (2020).

In this study, we aim to provide a detailed morphological analysis and illustrated redescriptions of *Orthochirus innesi*.



Figs. 1-4. *Orthochirus innesi*, habitus. 1-2. Male from Cairo. 3-4. Female from Cairo. 1,3. Dorsal view. 2,4. Ventral view. (Scale bar: 10 mm).

Material and Methods

Specimens of *Orthochirus innesi* were collected during night time using ultraviolet light in Wadi Degla protected area (Cairo, Egypt) in 20.09.2021. The collected scorpions were preserved in 96% alcohol. Identification of specimens of *Orthochirus innesi* were after Vachon (1952) and Lourenço & Leguin (2011). Photographs were taken by Canon EOS 7D. Stacking of pictures was made using Helicon Focus software. The illustration method under UV illumination is after Volschenk (2005). The trichobothrial nomenclature is after Vachon (1974) and morphological nomenclature after Francke (1977), Stahnke (1970), and Hjelle (1990). Materials were deposited in Alaşehir Zoological Museum, Manisa Celal Bayar University, Alaşehir, Manisa, Türkiye (AZMM).

Figs. 5-6. *Orthochirus innesi*, from Cairo, carapace. 5. Male. 6. Female.

Results

Family **Buthidae** C.L. Koch, 1837
Genus ***Orthochirus*** Karsch, 1891
Orthochirus innesi Simon, 1910
Figs. 1-39

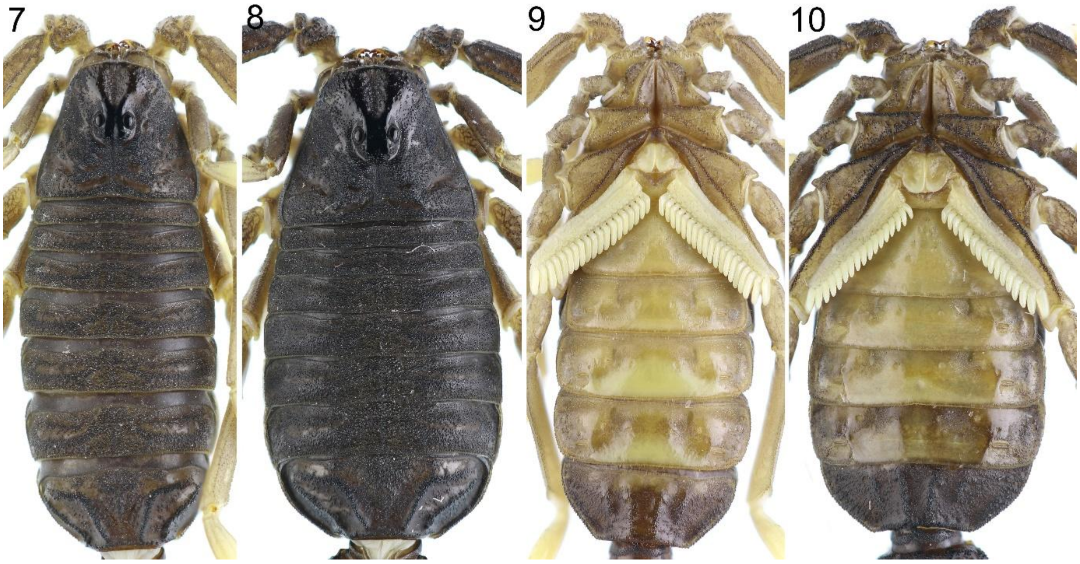
Orthochirus innesi Simon, 1910: 79.

Type Material: Holotype, ♀, Djebel Mokattam, near Cairo, Egypt, Deposited in the Muséum national d'Histoire naturelle, Paris (MNHN), not examined.
Synonym
Orthochirus seurati Pallary, 1929: 139-140 (synonymized by Foley, 1945).

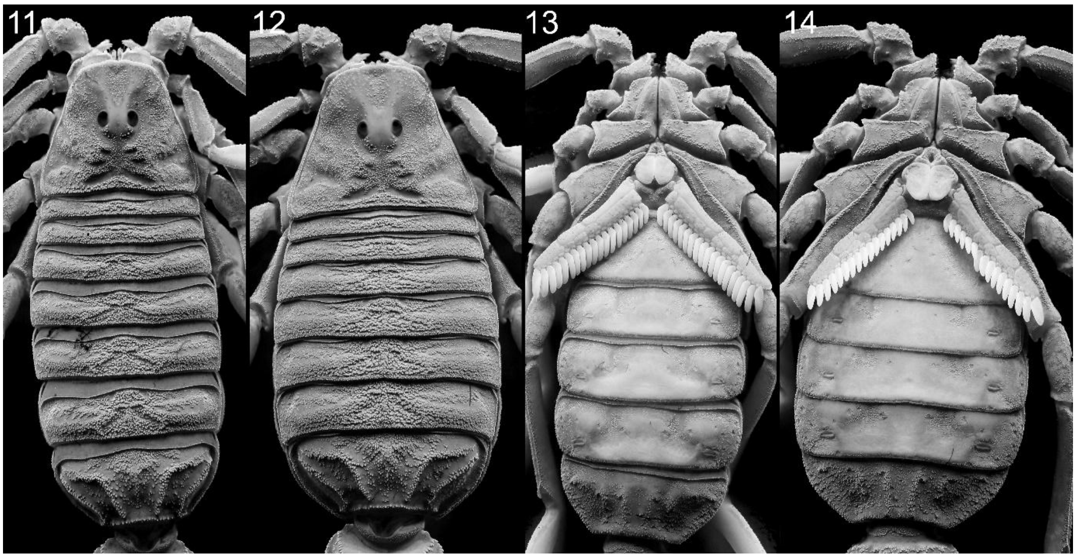
Material examined: Egypt, Cairo, Wadi Degla, 29°57'00"N, 31°20'43"E, 98 m a.s.l., 20.IX.2021, 7♂♂ & 8♀♀, *leg*. Yağmur & Badry (AZMM/Sco-2021:273-287).

Description: It is a small sized scorpion. Total length 27.21-29.75 mm in males and 28.66-29.18 in females.

Colouration: Prosoma: Carapace reddish-brown in males, dark reddish-brown to reddish black in females, black between median eyes (Figs. 1-6). Mesosoma: Tergites reddish brown in males, dark reddish-brown in females. Carinae and granulations black (Figs. 7-8). Sternites III-V lustrous dark yellow, VI lustrous brownish yellow, VII light brown in males, III-V lustrous brownish yellow, VI lustrous yellowish brown, VII dark reddish brown in females (Figs. 9-10). Metasoma dark reddish-brown to reddish black. Metasomal carinae and granules marked with blackish spots. Telson reddish-brown, aculeus reddish yellow at base, dark reddish at tip (Figs. 28-33). Chelicerae brownish yellow with light brown reticulations, fingers yellow with light brown base; teeth reddish (Figs. 5-6). Pedipalps trochanter and femur light yellowish brown, carinae and granules brown in males, yellowish brown with brown reticulations, carinae and granules dark brown in females. Patella pale yellow with faint light brown reticulation anteriorly in males, brownish yellow with brown reticulations in females. Chela lustrous yellow. Femur and posterior of tibia of legs yellowish brown and other segments are light yellow (Figs. 15-26).



Figs. 7-10. *Orthochirus innesi*, from Cairo, under white light. 7-8. Carapace and mesosoma. 9-10. Sternopectinal area and mesosoma, ventral view. 7,9. Male. 8,10. Female.



Figs. 11-14. *Orthochirus innesi*, from Cairo, under UV light. 11-12. Carapace and mesosoma. 13-14. Sternopectinal area and mesosoma, ventral view. 11,13. Male. 12,14. Female.

Morphology

Carapace: Carapace densely granular with minute granules, granules between anterior median carinae slightly larger and denser; interocular area, furrows, and around anterior median carinae area smooth. Anterior of carapace is convex and crenulate with 11-12 short and indistinct setae. Furrows moderate. The median eyes are separated by almost two ocular widths. Three pairs of lateral eyes exist. Only anterior median carinae are developed, which are smooth and rounded (Figs. 5-8, 11-12).

Coxa carinae and surface granular. Genital operculum ovoidal, divided longitudinally into two suboval and elongated scleritis, a small posterior indentation exists (Figs. 9-10).

Pectines: Pectinal teeth number 19-21 in males, 16-18 in females; three marginal and three to six median lamellae exist (Figs. 9-10).

Figs. 15-18. *Orthochirus innesi*, from Cairo, pedipalp. 15,18. Male. 16,17. Female. 15-16. Dorsal view. 17-18. Ventral view.

Figs. 19-26. *Orthochirus innesi*, from Cairo, pedipalp chela and chela fingers. 19-21, 25-26. Male. 22-24. Female. 19,22. Chela, ventral view. 20,23. Chela, external view. 21,24. Chela, dorsal view. 25. Movable finger dentition. 26. Fixed finger dentition.

Chelicerae: Cheliceral dentition characteristic of the family Buthidae (Vachon, 1963); teeth well developed and sharpened (Figs. 5-6).

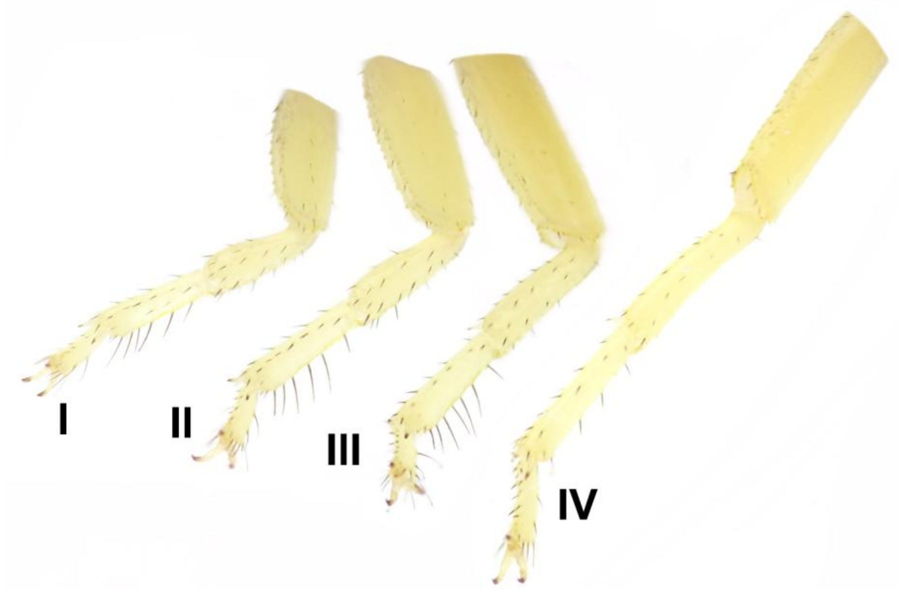
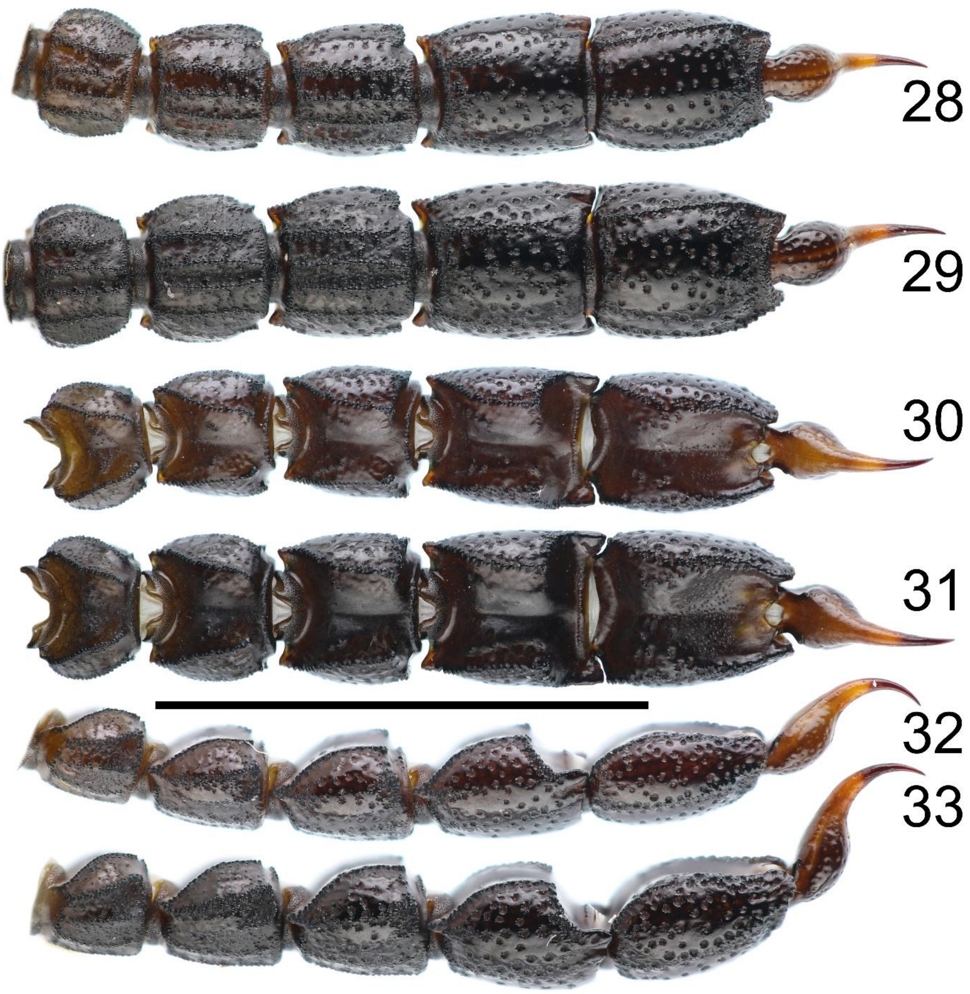
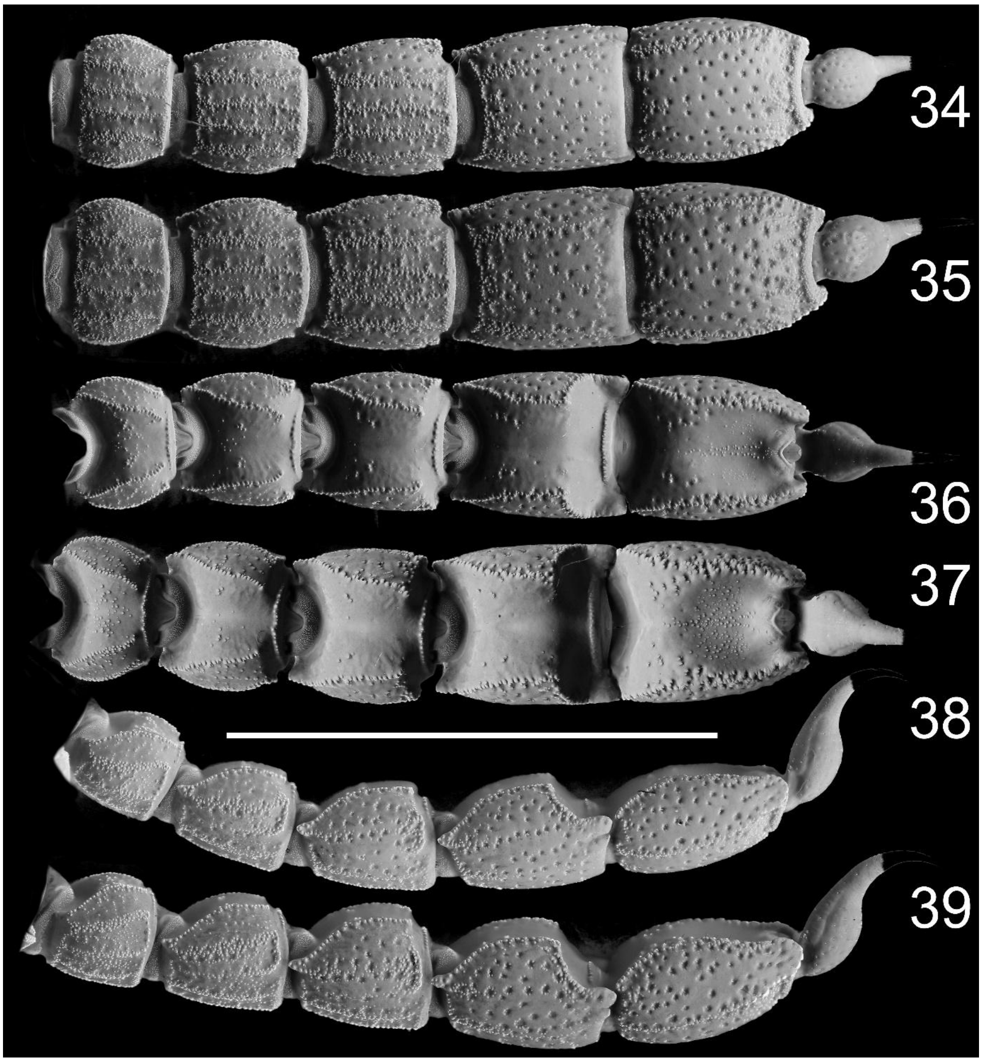


Fig. 27. *Orthochirus innesi*, male from Cairo, right legs I–IV.



Figs. 28-33. *Orthochirus innesi*, from Cairo, metasoma and telson, under white light. 28,30,32. Male. 29,31,33. Female. 28-29. Ventral view. 30,31. Dorsal view. 21,24. Lateral view. (Scale bar: 10 mm).



Figs. 34-39. *Orthochirus innesi*, from Cairo, metasoma and telson, under UV light. 34,36,38. Male. 35,37,39. Female. 34-35. Ventral view. 36,37. Dorsal view. 38,39. Lateral view. (Scale bar: 10 mm).

Fig. 40. Alive *Orthochirus innesi* specimen from Cairo in its natural habitat.

Fig. 41. General views of Wadi Degla, Cairo.

Pedipalp: Femur slender with five granular carinae. Dorsal and ventral intercarinal areas granular medially. Patella with seven carinae, only dorsointernal, ventrointernal and dorsal carinae developed, rest carinae obsolete. Dorsointernal and ventrointernal carinae slightly crenulate, rest carinae smooth. Chela smooth, lustrous, without carinae. The movable and fixed fingers bear 7-8 rows of denticles and four distal denticles. Internal and external denticles exist on distal 2/3 of the fingers. Both pedipalps with scattered and indistinct short setae (Figs. 15-26).

Trichobothriotaxy: Trichobothrial pattern is Type A, neobothriotaxic. Dorsal trichobothria of femur are arranged in beta-configuration with d_2 situated on dorsal surface (Vachon, 1974, 1975).
Legs: Tarsi with two rows of slightly spinoid setae ventrally. Tibial spurs present on legs III and IV (Fig. 27).
Mesosoma: Mesosomal segments I-VI densely granular, granules denser and larger in the middle of tergites and a median carina but reduced in segments I-II. Segment VII with five granular carinae, around median carina granular, around submedian carinae smooth (Figs. 11-12). Sternites III-VI smooth with finely granular patches and two smooth carinae. Sternite VII with granular four carinae. Intercarinal area granular, granules denser in females (Figs. 13-14).

Fig. 42. An *Orthochirus innesi* specimen observed hiding under the branches of a bush.

Metasoma and Telson: Metasomal segments I-II with 10 granular carinae, lateral and ventral intercarinal area granular without punctae. Segment III with 6 granular carinae, lateral intercarinal area granular, ventral intercarinal area smooth with granular patches with punctae. Segments IV-V strongly punctated with granular dorsal and ventrolateral carinae, lateral surfaces smooth, ventral surface with scattered granulations ventrally. Ventrolateral carinae of fifth segment moderate and slightly increase posteriorly. Ventral surface of fifth segment smooth but posterior 1/4 of the segment densely covered with fine granules. Telson: Vesicle elongated and smooth with a few shallow punctuations. Aculeus as long as the vesicle and moderately curved, subaculear tubercle absent (Figs. 28-39). Telson: Vesicle elongated and smooth with a few shallow punctuations. Aculeus as long as the vesicle and moderately curved, subaculear tubercle absent (Figs. 28-39).

Ecological Observations: The *Orthochirus innesi* specimens (Fig. 40) were collected in a shallow valley known as Wadi Degla. The habitat is a rocky area consisting of sandy soil and scattered bushes. Although a seasonal water stream exists in the area, the habitat was hot and very dry at the time of collection (Fig. 41). The specimens were observed on

rocks, on the surface of sandy soil, and beneath bushes (Figs. 40, 42, 43). We observed that the specimens moved their metasoma from right to left and left to right while walking or resting. They were also seen hiding under the bushes (Fig. 42).

Fig. 43. A female specimen of *Orthochirus innesi* preying upon a juvenile specimen, under flashlight (top) and UV light (bottom).

In addition, we detected a case of cannibalism: a female specimen was observed preying upon a juvenile, probably a second instar, individual (Fig. 43). Intra-specific cannibalism has not been previously reported in the genus *Orthochirus*. However, one case of inter-specific cannibalism has been documented by Joshi & Deshpande (2022) who reported the predation of *Hottentotta tamulus* (Fabricius, 1798) by *Orthochirus* sp. in India.

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Long-term dynamics of number, habitat-related distribution of *Galeodes araneoides* (Pallas, 1772) (Solifugae: Galeodidae) in the foothills south-eastern slopes of the Greater Caucasus

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Abstract

Based on the analysis of annual censuses data of the occurrence of solifuge *Galeodes araneoides* in the foothills of the south-eastern slopes of the Greater Caucasus, cyclically changing dynamics of number and age-sex composition, with periods of decline, rise and depression varying in duration and amplitude were determined. A change in the ratio of males and females of solifuges was noted towards an increase in the number of males, and a change in the ratio of adults and juveniles towards a decrease in young individuals. Uneven distribution of solifuges in different habitats, depending on the microrelief of the landscape, soil type, number and type of shelters, area and density of vegetation was noted. In general, periods of decline and rise in the number of solifuges, changes in their sex-age ratio reflect the influence of a complex of abiotic, biotic and anthropogenic factors on their fertility and survival, with the influence of the anthropogenic factor prevailing.

Keywords: camel spiders, *Galeodes*, relative number, population density, habitats, distribution.

Introduction

Studying the dynamics of numbers, population structure, habitat distribution of dominant taxa is an important component of planned ecological monitoring of natural areas. It allows us to assess their response to the impact of a complex of biotic and abiotic environmental factors. This can serve to predict their numbers and it is a kind of indicator

of the ecological state of ecosystems. Among the representatives of the order Solifugae Sundevall, 1833 (Arachnida), one of the dominant species is the common solifuge *Galeodes araneoides* (Pallas 1772) (Galeodidae, *Galeodes*). This species has a wide distribution range: from Ukraine, Crimea, the south of the European part of Russia and Kazakhstan in the north to Egypt, Palestine/Israel, Iraq, Iran, Syria, Türkiye, and Afghanistan in the south, including the North Caucasus (Dagestan, North Ossetia), South Caucasus (Armenia, Azerbaijan, Georgia) and the southwestern part of Central Asia (Turkmenistan) (Birula, 1938; Harvey, 2003; Mikhailov & Bakanov, 2022; World Solifugae Catalog, 2025). In Azerbaijan, it is found in the foothills of the Greater and Lesser Caucasus, the Talysh Mountains, the Kura Lowland, the Mugan, Mil and Shirvan Plains, the Gobustan Lowland and the Absheron Peninsula (Gadzhiev, 1996; Aliev & Novruzov, 2018; Aliev *et al.*, 2018; Novruzov, 2024). The species is characterised by a fairly high fertility for solifuges – 80-110 eggs in a clutch, the development of which begins in the oviducts of the female, expressed care for the offspring, a five-year postembryonic development, which has a larval, nymphal (I-V) and adult (imaginal) stages in its cycle (Aliev, 1984). Being polyphagous with a high saturation threshold and exceptionally high search and trophic activity, *G. araneoides* belongs to the species that play an important role in the trophic links of arid and semi-arid ecosystems. Data on the number and habitats distribution of dominant arachnid taxa is of particular importance in connection with the active anthropogenic transformation of lands that has been occurring in recent decades in the foothills of the Greater Caucasus, leading to a reduction in natural areas, which is one of the pressing environmental problems for the entire region. The aim of this work was to summarize and analyze data from long-term studies of the number and population density of *G. araneoides*, and the distribution of this species in habitats of different types in a mosaic-transformed area located in the foothills of the southeastern slopes of the Greater Caucasus.

Material and Methods

Studies of the relative number and density of *G. araneoides* were conducted annually during summer months from 1981 to 2021 in the Pirsagat-Djeyrankechmyaz interfluve (total area of about 6.5 thousand hectares), chosen as a model area located between the foothills of the southeastern slope of the Greater Caucasus and the Caspian Sea.

Solifuge numbers were carried using by route-transect method. The event was carried out in two stages: during the daytime with registration of individuals in shelters and at night, with registration of active individuals on the soil surface. Night studies were carried out with the diffused light of red and green LED lanterns (RK-8096-BL) with an illumination range of 5-6 m. Within one habitat, 3-4 routes were laid (1-1.5 km long with a counting tape width of 5 m). In total, up to 5 km of territory were surveyed per counting day. Individuals of all age groups were taken into account. Catching and fixing of the material was not carried out, since only one species of solifuges lived in the study region, and there was no need for their taxonomic identification. The obtained data were summarised, and the relative number per one km of the route was calculated using a standard formula. Then the population density per hectare of the territory was calculated. The distribution of individuals by habitats was also studied using the route method at the survey sites. In each habitat, plots of approximately 1000 sq. m were allocated. The survey of the plots was first carried out along their perimeter, then diagonally. The data obtained were summarised and extrapolated to the area of the whole territory. Based on the relief features, the predominant type and structure of soils in the territory under

consideration, five natural landscape zones were conditionally identified: sandy-stony, loamy-grey soil, loamy, grey soil-stony, grey soil dry steppe. In each zone, 2-3 habitats were additionally allocated, differing in the predominant type of shelter, area, density and composition of the vegetation cover. To assess the degree of ecological balance of the habitats, the coefficient of ecological stability of the landscape (K_{ES}) was calculated based on a comparison of the areas occupied by natural and modified landscape elements using the formula: $K_{ES} = \sum(Pi \cdot K_A) \cdot K_B) \,/\, (P \cdot K_A)$, where Pi = the area of the modified site and P = the total area of the habitat (Klementova & Geinige, 1995; Nikolaikin *et al.*, 2004; Chibilev *et al.*, 2019). The methodology specified in the literature was adapted by us for local conditions by selecting local values of the coefficients of ecological significance K_A (0.02-0.1) and geomorphological stability K_B (0.7-1.0) integrating qualitative and quantitative parameters of abiotic and biotic elements of the landscape (Sistema ocenki ustojchivosti ... - Sustainability Assessment System ..., 2013). The assessment of habitats by the coefficient of ecological stability was carried out on a scale: $K_{ES} < 0.33$ – ecologically unstable; 0.34-0.50 – unsteady stable; 0.51-0.66 – moderately stable; > 0.67 – steady stable.

A total of 19 habitat types were conditionally identified (the values of the ecological stability coefficient are given in brackets): 1) sandy areas with rare stones, figs and psammophytic vegetation (0.25); 2) sandy and pebble areas with psammophytic and euhalophytic vegetation (0.15); 3) grey soil plain, accumulation of rocky outliers, hemigalophytic vegetation (0.40); 4) clayey cliffs of drying river beds with wormwood-saltwort vegetation (0.60); 5) dry grey soil steppe areas, rodent burrows, feather-grass-fescue formations (0.90); 6) loamy slopes of erosion gullies with sparse semi-shrub vegetation (0.45); 7) fixed sands of the sea coast, rock fragments, psammophytic vegetation (0.20); 8) rocky slopes of the plateau with wormwood-cereal and small shrub vegetation (0.92); 9) loamy-grass plain areas with wormwood-forb formations (0.55); 10) loamy-grass rocky plain with ravines, xerophytic vegetation (0.85); 11) grey-brown soils, gentle slopes of hills with rodent burrows, grass formations (0.89); 12) fixed sands with rock fragments alternating with wormwood-saltwort areas (0.35); 13) grey soil plain with rare stones, rodent burrows, forb formations (0.60); 14) loamy undulating plain with rare stones, wormwood-saltwort vegetation (0.75); 15) rocky hillsides interspersed with rocky ledges, herbaceous vegetation (0.50); 16) rocky plateaus with a ridge of rocky outcrops, xerophytic-cereal formations (0.30); 17) rocky-sandy undulating plain with psammophytes and wild vineyard (0.45); 18) loamy-grey soil river valley with bird burrows, xerophytic vegetation (0.30); 19) dry grey soil steppe areas with forbs and rare shrubs (0.54). To compare the biodiversity of terrestrial arthropods in the habitats, previously published materials from faunistic studies conducted in this region were used (Novruzov, 2019). Comparison of the biodiversity of terrestrial arthropods in different types of habitats by the cluster analysis method (Fig. 1) using the Jaccard community index (Lebedeva *et al.*, 1999). Correlation-regression analysis of the dependence of the values of the relative abundance of solifuges on climatic factors (air temperature, precipitation), their population density on the intensity of pasture load (IPL) and on the coefficient of ecological stability of habitats (K_{ES}) was carried out in the PAST 3.26 program (Hammer *et al.*, 2001).

Clustering of habitats by the similarity index of the biodiversity of the terrestrial arthropod fauna identified four main groups among them, united by the commonality of biodiversity (distances 0.315; 0.365; 0.495; 0.585). Data on average monthly temperatures and precipitation in the study region for the period from 1981 to 2021 were taken from the website (www.pogodaiklimat.ru/history/37864.htm).

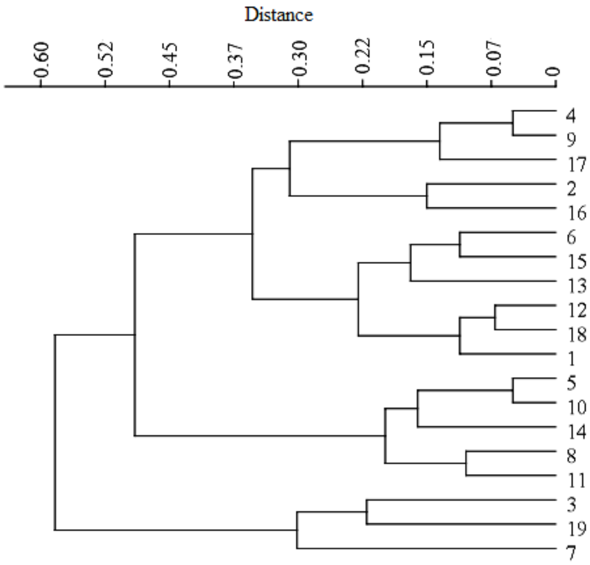

Fig. 1. Dendrogram of similarity of biodiversity of terrestrial arthropods in different types of habitats (1-19) of the studied area (Jaccard index).

Results and Discussion

The distribution of *G. araneoides* in the studied area had a mosaic character. This was facilitated by the heterogeneity of the landscape and ecological conditions of various habitats: the prevailing soil type, features of the surface microrelief, the presence of natural and artificial obstacles (temporary ponds, river courses, ditches, ravines, gullies, highways and railways, farm buildings), types and number of shelters, density and area of vegetation. Their localization in most cases was associated to various natural and artificial ground shelters (stones, rocks, burrows, random objects or structures of anthropogenic origin), shaded areas formed by clusters of rocks and plant formations. The data of route censuses of the relative abundance and population density of *G. araneoides* carried out for the period from 1981 to 2021 (more than 40 years) in the chronogram are presented (Fig. 2). Comparison of data on the relative population size for the entire study period of the specified territory showed that *G. araneoides* is characterised by periodic cyclicality of changes in the indicators of population size and density, expressed in their periodic increases, decreases and depressions. The causes of such cyclicality changes could presumably be general climatic conditions of different years; the formation of temporary (spring) ponds in years with increased precipitation, leading to a change in microclimatic conditions and fluctuations in the number and ratio of food objects in habitats; changes in the number of eggs in clutches of females; mortality of pre-adult individuals of different ages during wintering, topical expansion by competitors, death from natural enemies, as well as anthropogenic pressure (seasonal grazing, earthworks, episodic trapping by students during summer practice and by naturalists for collections). The chronogram presented in Fig. (2) has a complex cyclical appearance and demonstrates periodic cycles of rise and fall in numbers with different frequencies, having periods of different durations: high-frequency (lasting 2-3 years); medium-frequency (lasting 4-5 years); low-frequency (periods of depression, lasting 5-7 years).

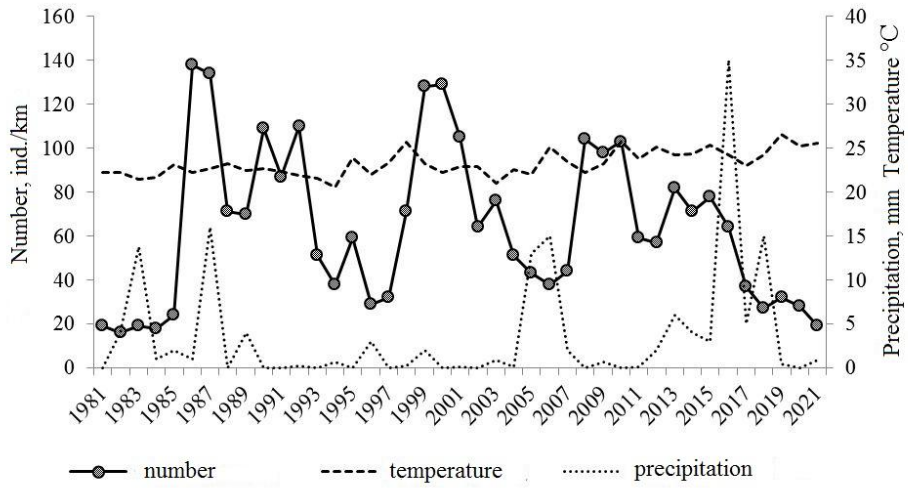

Fig. 2. Chronogram of the relative number of solifuges based on generalised data from summer counts on routes (ind./km) for the period 1981-2021 depending on climate factors (air temperature, precipitation).

Comparison of the data on the number of solifuges in different years with the climatogram data of these years (Fig. 2) showed that the cycles of increase and decrease in the population as a whole are not always comparable with the amplitudes of average monthly temperatures and average monthly precipitation noted in the same years. The Pearson correlation coefficient for the indicators of the number of individuals and average monthly temperatures and average monthly precipitation had low values (r = -0.0851–0.1795, and r = -0.0998–0.0105, respectively) (Fig. 3). The indicators of average monthly temperatures and precipitation themselves also correlated weakly with each other (r = 0.0723).

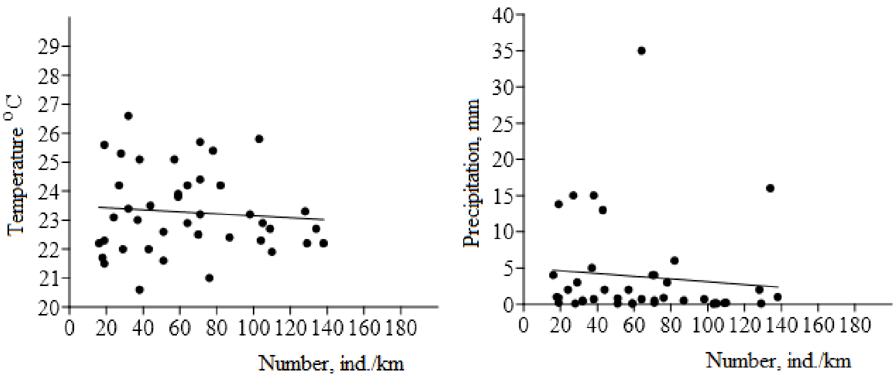

Fig. 3. Relationship between relative abundance with climate factors (air temperature, precipitation).

In my opinion, the cause-and-effect relationship between fluctuations in the number of solifuges and human economic activity is more significant. To identify this relationship, we considered one of the traditional types of human economic activity – pasture cattle breeding. As is known, the intensive use of natural areas for pastures has negative consequences for both plants and soil, as well as for terrestrial fauna. The physicochemical properties of the soil, the density and height of the vegetation cover, the structure of arthropod communities and other invertebrates change (Prokhorova, 1975; Rusanov, 1990; Ganieva *et al.*, 2019). This type of human activity is assessed by the

indicator intensity of pasture load (IPL). For a more objective assessment of the impact of this factor on the number of solifuges, the density of their population (the number of individuals per area of 1 ha) was calculated (Fig. 4), as well as the change in the sex-age ratio of individuals of the population occurring in different years (Fig. 6). The diagram in Fig. (4) shows the changes in the solifuge population density and the intensity of pasture load (IPL) in the region over the period from 1981 to 2021. The periods of decline in the solifuge population corresponded well to the years marked by an increase in the volume of grazing in the region (18.4-22.5%), and the period of increase in the arachnid population corresponded to the years when cattle breeders were subjected to strict restrictive sanctions from higher authorities reducing the volume of grazing (6.6-12.5%). Correlation and regression analysis showed a high degree of positive correlation between these two indicators (Pearson correlation coefficient r = 0.925-0.985) (Fig. 5).

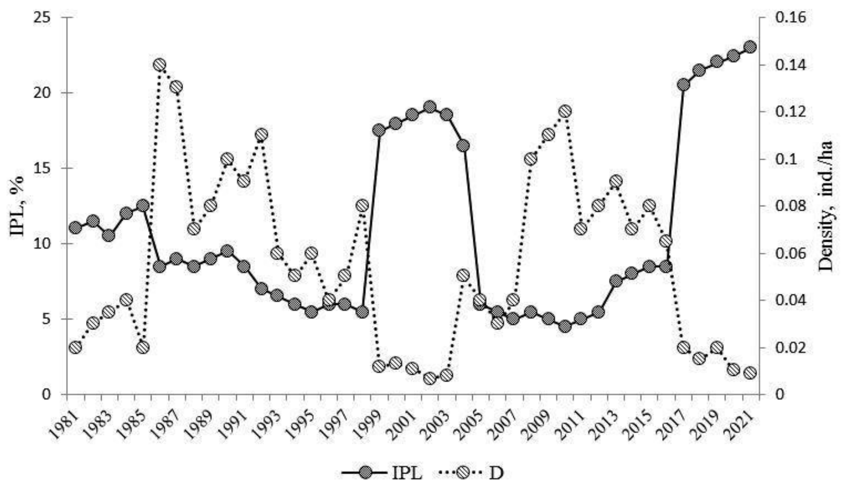

Fig. 4. Chronogram of the population density of *Galeodes araneoides* and the intensity of pasture load (IPL) in the studied area for the period 1981-2021 according to our own and literature data (Ganieva *et al.*, 2019).

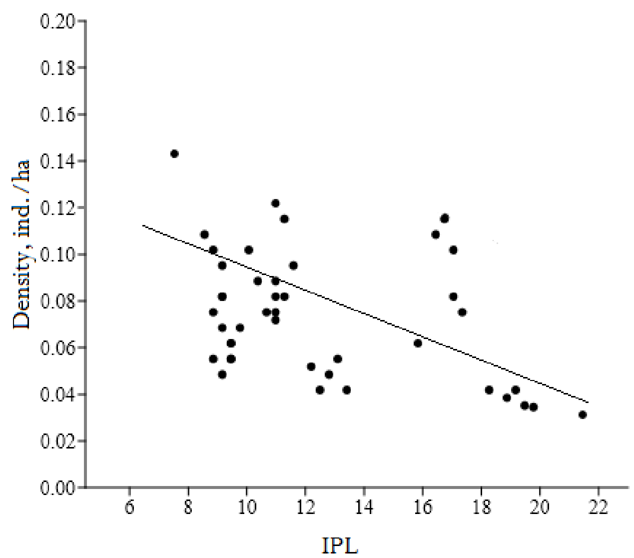

Fig. 5. Relationship between the population density indices of solifuges with the intensity pasture load (IPL) for the period 1981-2021.

The population density level and its age and sex composition can also be used to judge its condition and prospects for its preservation in the coming years. The graph in Fig. (6) shows that distinct spikes in the density of solifuges occurred in 1986-1987, 1990-1992, 1999-2000, 2008-2010. At the same time, despite the cyclical dynamics of the population density indicator over a 40-year period of research, there is a noticeable tendency to decrease the maximum density values from 0.12-0.13 ind./ha (1981-2000) to 0.07-0.08 ind./ha (2000-2021), which in itself is unfavourable evidence. The opposite trend is observed in the percentage ratio of sexes (Fig. 6). Whereas from 1981 to 2000, on average, 67.3% of females accounted for 6.2% of males (0.09), from 2000 to 2021, 80.9% of females already accounted for 9.8% of males (0.12). Regarding the ratio of adults to immature individuals, from 1981 to 2000 the ratio of adults (73.5%) to juveniles (26.2%) was 0.35, while from 2000 to 2021 the ratio of adults (90.7%) to juveniles (9.1%) was only 0.10. The decrease in the ratio of adults to juveniles is also a prognostically unfavourable indicator and can be explained by two reasons: a decrease in the number of eggs in clutches or low survival of juveniles during the hibernation period.

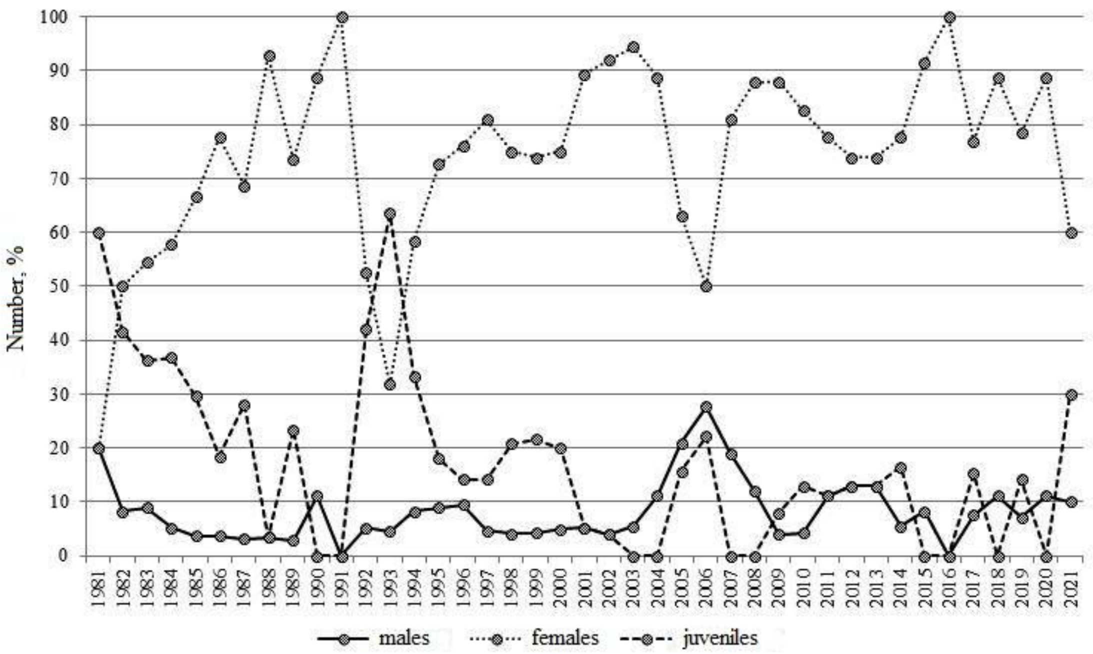

Fig. 6. Changes in the ratios of adult males and females and juvenile solifuges during the accounting period (1981-2021).

Thus, it can be assumed that the dynamics of changes in the number and density of the solifuges population is less associated with climate change during the years of research. To a greater extent, there is a connection with the anthropogenization of landscapes leading to a reduction in natural areas and active human economic activity (plowing and cultivating land, grazing, earthworks, etc.). In addition to determining the dynamics of the relative number and density of solifuge populations by year in the study area, we also compared the density in individual habitats of different types for the period from 2012 to 2018. According to the data presented in the diagram (Fig. 7), it is clear that the density of solifuges has peak high values in habitats No. 11, 8 and 5, which have fairly similar topical characteristics and similarity in the biodiversity of the arthropod fauna of potential hunting objects of solifuges (Fig. 1). An additional correlation and regression analysis was performed with the construction of a generalised linear model of

changes in the solifuge population density depending on the coefficient of ecological stability of biotopes (K_{ES}) (Fig. 8) and showed that the highest solifuge density was noted in ecologically stable habitats No. 5, 8, 10 and 11 (Density = 0.17-0.29 ind./ha; K_{ES} > 0.67), and the lowest density was in ecologically unstable habitats No. 1, 2, 7, 16 and 18 (Density = 0.03-0.06 ind./ha; K_{ES} < 0.33). Average solifuges density values were noted in unsteady stable habitats No. 3, 4, 6, 9, 12-15, 17, 19 (K_{ES} = 0.34-0.50). Habitats No. 2 and 7 were apparently of particular low value for solifuges, as evidenced by the lowest density (0.03-0.04), since they concentrated a limited set of ecological conditions necessary for these arachnids (soil type, shelter).

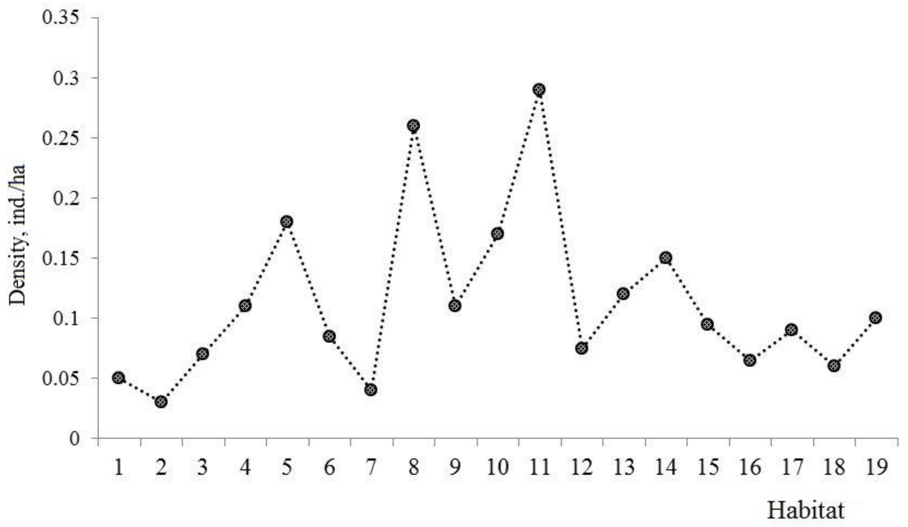

Fig. 7. Diagram of density of *Galeodes araneoides* in different types of habitats for the period from 2012 to 2018.

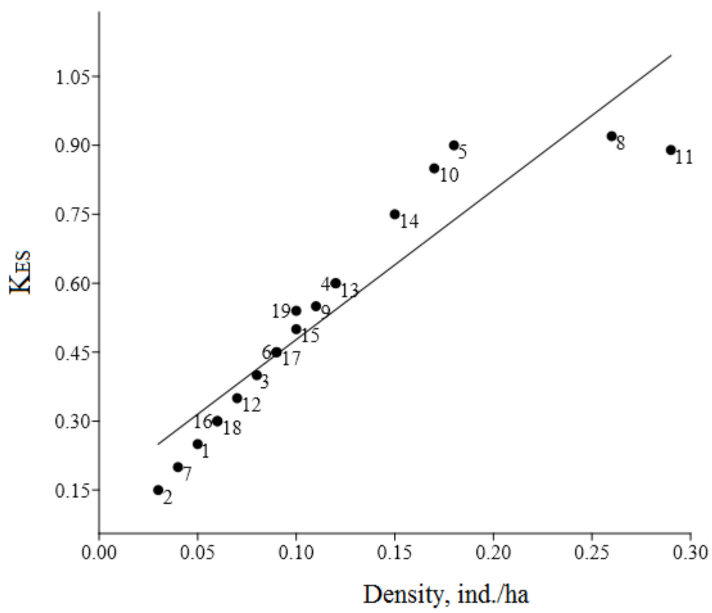

Fig. 8. Relationship between the population density of solifuges with the coefficient of ecological stability (K_{ES}) in different types of habitats (1-19) (r = 0.929-0.932).

The obtained results indicate that from the whole wide range of habitats, solifuges prefer those that probably have a more acceptable set of macro- and micro-ecological conditions: dense soil; flat or gently undulating surface relief; shelters that are reliable in terms of inaccessibility for outsiders (cavities under rocks, labyrinths of rodent burrows); small in area and sparse in density grass and shrub cover that do not limit their locomotor activity when searching for and pursuing potential preys. The solifuge populations in the studied area, in addition to the impact of nature abiotic and biotic factors, experiences significant pressure from the anthropogenic factor, which over the years increasingly reduces the tendency for its natural rehabilitation.

Conclusion

The dynamics of the relative number of the solifuge *G. araneoides* population is predominantly of the ephemeral type. It has a cyclical nature with periods of rise, fall and depression of varying duration, which presumably reflect the determining influence of a complex of closely related abiotic and biotic factors, as well as anthropogenic pressure, on the fertility and survival of these arachnids. Their localization in most cases is tied to various natural and artificial ground shelters (stones, rocks, burrows, random objects of anthropogenic origin), shaded areas formed by clusters of rocks and plant formations. Consequently, the degree of abundance of the species in each of the habitats largely depends on the spectrum of landscape components presented in them, creating a wide range of choice of microbiotic conditions. The highest density of solifuges (0.17-0.29 ind./ha) was observed in habitats with dense soil, flat landscape with smoothed microrelief of the surface, presence of different types of reliable shelters, small area and sparse density of vegetation. The lowest density of solifuges (0.03-0.06 ind./ha) was noted in habitats with loose sandy or sandy-loamy soil, denudation relief of the surface, limited number of shelters and medium or high density of vegetation. Obviously, there is a multifactorial process of influence on the choice of the localization site of these arachnids for the favourable implementation of the entire complex of their life strategies. A change in the sex-age ratio towards an increase in the number of males and a decrease in the number of young individuals should be considered an unfavourable prognostic indicator for a given population.

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Jumping spiders of Bangladesh: Genus *Phintella* Strand, 1906 (Araneae: Salticidae: Chrysillini)

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Abstract

A study of some jumping spiders of genus *Phintella* Strand was carried out from Khulna, Bangladesh. Two species are recorded in this study of which *P. bidentata* sp. n. is described as new to science and another one *P. vittata* Strand is a new locality record for the area of the present study. Brief generic diagnosis and distribution are provided together with the description of the species.

Keywords: Jumping spider, Araneae, Salticidae, Salticinae, *Phintella*, Bangladesh.

Introduction

Family Salticidae is a vast, widespread, cosmopolitan and fascinating group of jumping spiders. Members of this family are important predatory components in the crop-fields and gardens of Bangladesh. The family at present is composed of 6809 species belonging to 689 genera in the world (World Spider Catalog, 2025). Members of the genus *Phintella* Strand are not known to the fauna of Bangladesh. These are small, metallic colourful and very attractive but do not make any web in their habitat. Habitually, they are very busy and can jump an unusual distance during preying. Usually, They are found to and fro on the twigs and leaves of shrubs.

Genus *Phintella* was first described by W. Bösenberg and E. Strand in 1906 with the type-species *Telamonia bifurcilinea* (Bösenberg & Strand, 1906). At present, the genus is represented by 84 species in the world (World Spider Catalog, 2025). In Indian Subcontinent, the genus was first reported by Tikader (1967) who placed it under the genus *Salticus* but later it was replaced to *Phintella* by many authors. Records of these spiders in India and other Asian countries are satisfactory (Żabka, 1985; Prószyński,

1992; Chen & Zhang, 1991; Barrion & Litsinger, 1995; Lei & Peng, 2013; Caleb, 2014; Huang *et al.*, 2015; Roy *et al*., 2016; Dhali *et al*., 2017; Luong, 2017; Luong *et al.*, 2016; Peng, 2020; Hoang *et al*. 2023; Wang *et al.*, 2023; Sudhin *et al*., 2023, 2024) but in Bangladesh, only one species is reported (Okuma *et al.*, 1993; Biswas, 2009, 2019). The present paper describes two species of genus *Phintella* of which one species *P. bidentata* sp. n. is new to science and another one *P. vittata* (C.L. Koch, 1846) is a new record for the area of present study.

Material and Methods

The specimens of this study were collected by hand and jerking the branches of shrubs on an inverted umbrella placed underneath the plants, from Khulna, southern part of Bangladesh. After sorting, the specimens were preserved primarily in 70% ethanol and after identification, each specimen is preserved separately into Audmans' preservatives following Lincoln & Sheals (1979). The preserved specimens are currently in the collection of the Department of Zoology, Khulna Govt. Womens' College, Khulna, Bangladesh and will be deposited to the museum of the Department of Zoology, University of Dhaka, Bangladesh, in due course of time.

All the necessary body-parts of the specimens (viz. – chelicerae, maxillae, labium, pedipalps etc.) are dissected out and illustrated under stereo-zoom binocular microscope. Female genitalia are dissected out and cleared in 10% KOH for 3-5 minutes following Levi (1965) and Tikader (1987). All measurements are in millimetres (mm). Leg measurements are given as in the following sequence: femur, patella, tibia, metatarsus, tarsus and total length.

Identification references consulted are: Tikader & Biswas (1981), Żabka (1985), Barrion & Litsinger (1995), Fuhn & Gherasim (1995), Prószyński (1992), Biswas (2009), Luong (2017), Roy *et al.* (2016), Peng (2020), and Sudhin *et al.* (2024).

Results

Taxonomy

Family **Salticidae** Blackwall, 1841
Subfamily **Salticinae** Blackwall, 1841
Tribe **Chrysillini** Simon, 1901
Genus ***Phintella*** Strand, 1906
Type-species ***Phintella bifurcilinea*** (Bösenberg & Strand, 1906)

Diagnosis: The members of genus *Phintella* are very small to small (3.0 mm to 4.0 mm), colourful spiders. Body slender, usually covers with metallic iridescent scales (Luong *et al*., 2016). Carapace somewhat oval or rectangular in some, relatively high (elevated) with distinct posterior slope. Chelicerae usually unidentate, while in some with two promarginal and one retromarginal teeth. Male palps simple, almost uniform in the genus; tibial apophysis simple. Abdomen oval or elongately oval, with some pale blue or yellow or mixture-coloured bands. Epigyne simple, sometimes with a scapum or posterior pockets; copulatory ducts usually not twisted, variable in length; spermathecae rounded in most species (Prajapati *et al*., 2021); fertilization ducts situated at the anterior region of spermathecae.

Biological note: Spiders of the genus *Phintella* are usually found on the leaves and twigs of shrubs in the gardens and forests of Bangladesh. They do not spin any web

but only females can make typical nests by folding green leaves during breeding season in which they lay eggs and stay there up to the maturity of spiderlings. Adults usually move scattered to and fro from plant to plant for searching prey and mating partners. They catch their preys by leaping on them for long distances comparing to their body size. Their preys include small pest insects viz. – green leaf hopper (GLH), brown plant hopper (BPH), white backed plant hopper (WBPH), aphids, flies, mosquitoes, etc.

Distribution: India, China, Myanmar, Vietnam, Japan, Malayasia, Srilanka, Singapore, and Indonesia.

Key to the species of *Phintella* of Bangladesh

1. Cephalothorax not broad, dorsum black with one white basal band; abdomen elongately oval with a white band and black terminal spot; chelicerae with 2 teeth on retromargin, fang very long and curved terminally; maxillae and labium elongate, scopulate; sternum elongate with anteriorly concave; male palp with pointed cymbium and broad tegullum and apophysis .... ***Phintella bidentata*** **sp. n.**

- Cephalothorax broad, dorsum with a large median white transverse band and 2 lateral bands; abdomen oval, medially broad, with 3 white bands; chelicerae with 1 promarginal band 2 retromarginal teeth, fang short; sternum broad basally; maxillae and labium laterally wide, scopulate; male palp with short cymbium and apophysis .... ***Phintella vittata***

1. *Phintella bidentata* sp. n.

(Figs. 1a-g)

Material examined: Holotype: 1 male. Paratype: 1 male; both are collected from the same locality.

Type locality: Bangladesh: Dumuria, District Khulna, dates: 07.03.2021 and 18.12.2023, Coll. V. Biswas. Types are at present in the collection of the Department of Zoology, Khulna Government Womens' College, Khulna and will be deposited to the Museum of the Department of Zoology, University of Dhaka, Bangladesh.

Description of the male (Fig. 1a): Body very small, metallic bluish-brown, legs and abdomen light-brown. Total body length 3.40. Carapace 1.56 long and 1.50 wide; abdomen 1.84 long and 1.20 wide.

Cephalothorax: Broad, robust, nearly square-shaped, with anterior region little high/elevated; anterior margin nearly straight, blue-black, dorsum with a white transverse band. Eyes unequal, pearly-white, each with black basal bands; anterior row of eyes faintly recurved with the anterolaterals distantly placed; anterior medians (AME) 2 times larger than anterolaterals (ALE); 2nd row of eyes (PME) minute, brown, placed little far from anterior row; posterior row of eyes (PLE) larger than posteromedians (PME), straight and placed marginally. Ocular trapezium nearly rectangular (Fig. 1a). Eye diameters: AME 0.37, ALE 0.22, PME 0.06, PLE 0.14; Inter eye-distance: AME–ALE 0.04; PME–PME 0.61; PME–PLE 0.12; PLE–PLE 0.89; ALE–PLE 0.45; AME–AME 0.03. Chelicerae long, curved behind, basally wide, 0.45 mm long, only retromargin with two teeth (Fig. 1b). Maxillae and labium longer than wide, darker in colour, scopulate anteriorly (Fig. 1c). Sternum light brown, longer than wide, anterior margin concave, posteriorly pointed (Fig. 1d). Male palps are simple, almost uniform in shape (Figs. 1e-g). Leg formula 4123 and measurements (in mm) of leg segments are shown in Table (1).

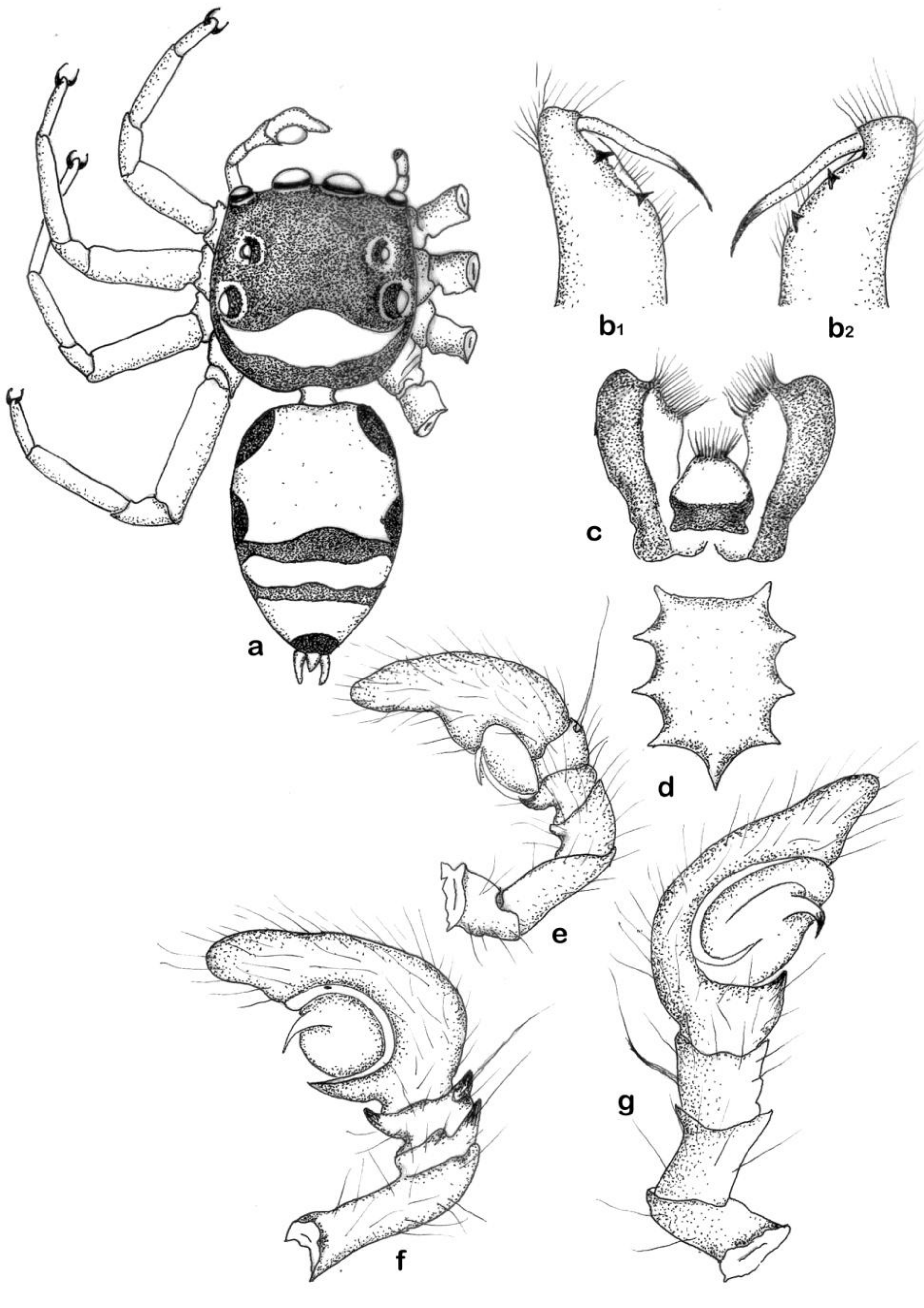

Fig. 1. *Phintella bidentata* sp. n. a. Whole body (dorsal view). b_1 - b_2. Chelicerae. c. Maxillae & labium. d. Sternum. e-g. Male palp. e. lateral view. f. retrolateral view. g. ventral view.

Table 1. Measurements of leg segments of *Phintella bidentata* sp. n.

Leg	Femur	Patella	Tibia	Metatarsus	Tarsus	Total
I	0.85	0.35	0.95	0.61	0.38	3.14
II	0.77	0.35	0.95	0.60	0.35	3.02
III	0.65	0.27	0.82	0.60	0.35	2.69
IV	0.92	0.35	0.95	0.62	0.40	3.24

Abdomen: Oval, longer than wide, metallic blue-green with two black bands, posteromedially broader, clothed with brown erect hairs and pubescence; ventrally pale-brown; lateral spinnerets longer and median blunt (Fig. 1a).
Female: Unknown.
Etymology: The species is named due to the presence of two retromarginal teeth on the chelicerae.
Diagnosis: The present species *P. bidentata* sp. n. appears close to *P. vittata* (C.L. Koch, 1846**),** *P. arcuata* Huang, Wang & Peng, 2015, and *P. handersoni* Sen, Sudhin & Caleb, 2024 (Żabka, 1985; Huang *et al.*, 2015; Sudhin *et al.*, 2024) but it stands distinct in having the following characters:

(1) Position and arrangement of eyes on the carapace *P. bidentata* sp. n. are nearly similar to those of the above species but their structures are quite different.
(2) Cephalothorax is wider than *P. vittata*, *P. arcuata*, and *P. handersoni.*
(3) Cheliceral structure and dentition different.
(4) Structure of maxillae, labium and sternum different and
(5) Structure of palpal organ of *P. bidentata* differs with those of *P. vittata* and its other Indian congeners and species known from elsewhere (Żabka, 1985; Chen & Zhang, 1991; Prószyński, 1992; Barrion & Litsinger, 1995; Fuhn & Gherasim, 1995; Caleb, 2014; Huang *et al.*, 2015; Luong *et al.*, 2016; Sudhin *et al.*, 2023, 2024; Wang *et al.*, 2023).

Therefore, the species, is described as new to science.

2. *Phintella vittata* (C.L. Koch, 1846)
(Figs. 2a-f)

1846. *Plexippus vittatus* C.L. Koch, 1846: 125, fig. 1185 (Dj) (C.L. Koch, 1846).
For synonyms, see World Spider Catalog (2025).

Material examined: 1 male, P.C. College campus, Bagerhat, dt. 08.II.1992, Coll. V. Biswas; 1 female Mirpur Botanical garden, Dhaka, dt. 12.IV.1996, Coll. V. Biswas; 1 male, Daulatpur, Khulna, dt. 21.IX.2001, Coll. V. Biswas & W. Rahman; 1 male & 1 female, KZS campus, Khulna, dt. 05.XII.2007, Coll. V. Biswas.

Description of male (Figs. 2a-b)**:** Body very small to small; metallic bluish-brown in colour. Legs and abdomen light brown. Males a little smaller than females. Total body length (male) 3.12. Carapace 1.58 long and 1.45 wide; abdomen 1.54 long and 1.44 wide.

Cephalothorax: Rectangular. Longer than wide, basally broad, narrowing anteriorly, clothed with fine iridescent hairs of different metallic colours; dorsum with two lateral and one median, transverse white band. Eyes pearly-white, each ringed with black band; anterior row of eyes slightly recurved; anteromedians twice larger than anterolaterals; 2nd row of eyes minute; posterior row straight, rather marginally placed (Fig. 2a). Chelicerae brown, elongate, anteriorly narrowed, each of inner and outer margins with 1 and 2 teeth respectively (Fig. 2c). Maxillae and labium brown, posteriorly broad and narrowing, scopulate anteriorly (Fig. 2d). Sternum wider below, pointed behind, anterior margin concave (Fig. 2e). Legs strong and stout; I and II more stouter than III and IV; tibiae and metatarsi of I and II provided with 3 and 2 ventral spines respectively; leg formula 4123 and the measurements of leg segments are shown in Table (2). Male palpal organ dark grey, typical with embolus short and thin (Fig. 2f).

Abdomen: Abdomen oval, medially broad, longer than wide, narrowed at both ends ; dorsum decorated with metallic green brown patches; ventrally brown, clothed with glazy hairs and pubescence.

Table 2. Measurements of leg segments of *Phintella vittata*.

Leg	Femur	Patella	Tibia	Metatarsus	Tarsus	Total
I	0.80	0.30	0.90	0.60	0.30	2.90
II	0.70	0.30	0.90	0.60	0.30	2.80
III	0.60	0.20	0.80	0.60	0.30	2.50
IV	0.90	0.30	0.90	0.60	0.40	3.10

Female: little larger than the male. Total body length 3.30. Carapace 1.60 long and 1.50 wide; abdomen 1.70 long and 1.55 wide. Body slightly dull-coloured but with a mixture of metallic blue and brown.

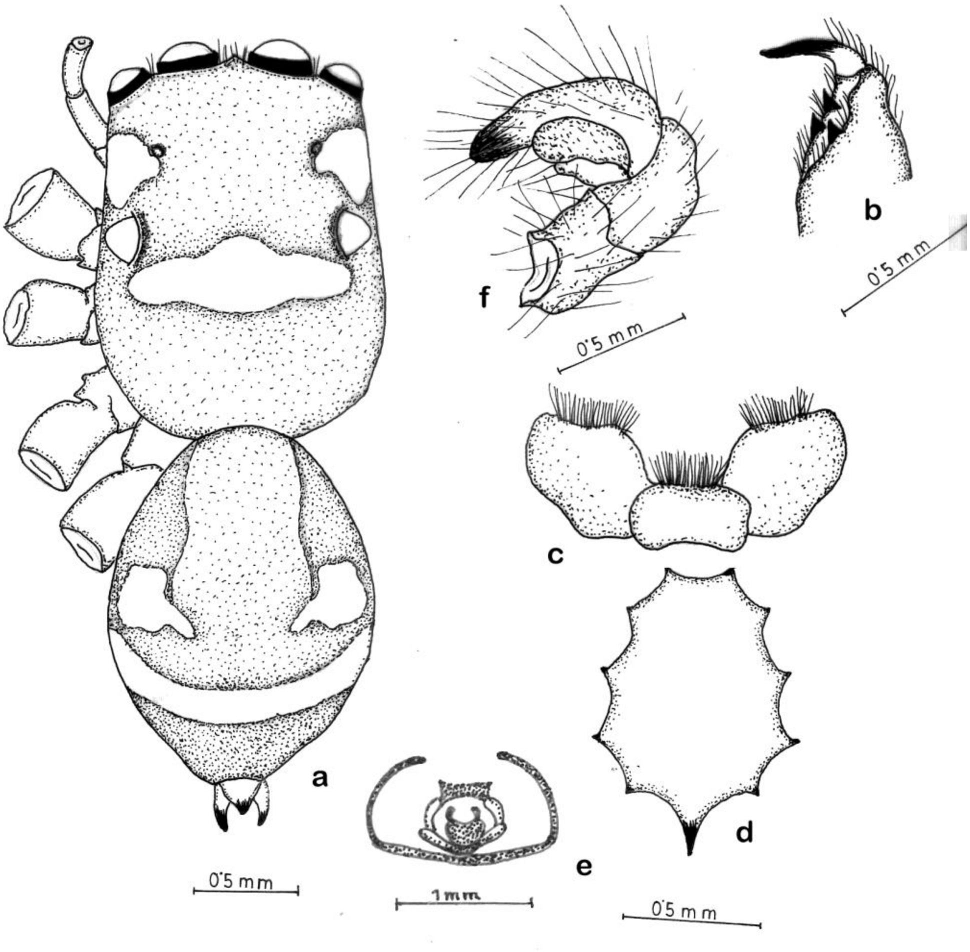

Fig. 2. *Phintella vittata* (C.L. Koch, 1846). a. Whole body (dorsal view) of male. b. Chelicerae. c. Maxillae & labium. d. Sternum. e. Epigynum. f. Male palp.

Cephalothorax: light brown with a light patch below the ocular area; whole dorsum covered with grey-brown, pearly, scale-like setae those form a metallic field; it appears shiny when spiders move to and fro on the leaves or twigs of the shrubs. Eyes pearly-

white, each with black band. Legs long and strong, greyish-yellow in colour with grey-brown spines and hairs. Leg formula same as male (4123), tarsi with two claws.

Abdomen: broad, elongately oval, clothed with metallic hairs and setae. Spinnerets grey, clypeus brown. Chelicerae, maxillae, labium, and sternum are brown-grey and nearly same in appearance and other characters. Epigyne (Fig. 2e) strongly sclerotized, posterior margin bent and protruding beyond the line of epigastric furrow; copulatory opening clearly visible, sclerotized. Spermathecae oval.

Distribution: Bangladesh: Bagerhat, Dhaka and Khulna; India (Prószyński, 1992; Sudhin *et al.*, 2023, 2024); Viet-Nam (Żabka, 1985; Luong *et al.*, 2016); China (Chen & Zhang, 1991; Peng, 2020).

Acknowledgments

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Description of a new species of the genus *Habrocestum* Simon, 1876 (Araneae: Salticidae) from Chikhaldara, Maharashtra, India

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Abstract

Newly recorded spider species of genus *Habrocestum* is found in Chikhaldara, Dist. Amravati, Maharashtra, India. The spider genus is identified using references of the World Spider Catalog. In India, there are nine species of *Habrocestum* reported till now. The present study describes a new species, *Habrocestum chikhaldarensis* sp. n., from Chikhaldara, Maharashtra, India.

Keywords: Salticidae, *Habrocestum*, new species, taxonomy, Chikhaldara, India.

Introduction

Salticidae is the largest spider family in the world grouping 689 genera and 6809 species (World Spider Catalog, 2025) and they are commonly called jumping spiders because most of the species are very active in warm weather, leaping from leaves, bark, twigs in the search of prey or to escape from potential predators (Athira *et al.*, 2020).

Genus *Habrocestum*, created by Simon (1876), has 59 species, with nine endemic species recorded in India (World Spider Catalog, 2025). They are: *Habrocestum benjamin* Jose, Caleb & Sudhikumar, 2024 ♂♀, *H. imilchang* Kadam & Tripathi, 2023 ♂, *H. kerala* Asima, Caleb, Babu & Prasad, 2022 ♂♀, *H. longispinum* Sankaran, Malamel, Joseph & Sebastian, 2019 ♂♀, *H. mookambikaense* Sudhin, Sen, Caleb & Hegde, 2022 ♂♀, *H. sahyadri* Asima, Caleb & Prasad, 2024 ♂♀, *H. shendurneyense*

Asima, Caleb, Babu & Prasad, 2022 ♂♀, *H. swaminathan* Jose, Caleb & Sudhikumar, 2024 ♂♀, and *H. togansangmai* Kadam & Tripathi, 2023 ♂.

This work describes and illustrates a new species from the Chikhaldara in Maharashtra, India to expand the geographic distribution of *Habrocestum* in India to Maharashtra too. It is something near to *H. longispinum* from Kerela (Sankaran *et al.*, 2019).

Material and Methods

The data used in the current study was gathered in March 2022 in the Chikhaldara. One female specimen was obtained from the Chikhaldara, Maharashtra, India. It was then preserved in 70% ethanol and deposited at the Spider Research Laboratory (SR - Lab) in J.D.P.S. Daryapur, Maharashtra. The references of the World Spider Catalog (2025) were used to identify the spider. It was measured using a Carl Zeiss Stemi 2000 C Stereo Zoom microscope and identified using an Olympus SLI500 stereomicroscope to determine the genus. The genitalia were removed using a fine surgical knife, cleaned in a 10% potassium hydroxide (KOH) solution, then transferred to alcohol and examined. Dorsal and ventral views of epigyne were photographed. To confirm the identification, published literature on the genus was examined. All measurements are in millimetres. Femur, patella, tibia, metatarsus, tarsus, and total length are the measurements of the legs in this order. Abbreviations: ALE = anterior lateral eye; AME = anterior median eye; D = dorsal; JDPSMD = J. D. Patil SangludkarMahavidyalaya, Daryapur; L = length; MOQ = median ocular quadrangle; Pl = prolatreral; PLE = posterior lateral eye; PME = posterior median eye; SRL= Spider Research Lab; v = ventral; W = width.

Taxonomy

Family **Salticidae** Blackwall, 1841
Genus: ***Habrocestum*** Simon, 1876
Habrocestum chikhaldarensis sp. n.

Type Material: Holotype, female, from Chikhaldara, dist. Amravati, Maharashtra, India in March 2022 collected by Atul K. Bodkhe (SRL, JDPSMD).
Type Habitat: Free-living spiders are typically found on the ground, on stones, between wall crevices, and in rock crevices.
Etymology: The name "*chikhaldarensis*" is provided on the site (Chikhaldara) from which it was found.
Diagnosis: This species resembles *Habrocestum longispinum* Sankaran, Malamel, Joseph & Sebastian, 2019, however it may be differentiated by the epigynum having the spermathecae separated from one another, different oviducts, and an inverted 'W'-like structure at the bottom. The ocular region of *H. longispinum* contains five white dots, whereas in *Habrocestum chikhaldarensis* sp. n. those white spots are absent.

Description
Habrocestum chikhaldarensis sp. n.
Female (Holotype) Total length 8.53, cephalothorax 3.79 long, 2.91 wide, abdomen 3.826 long, 2.805 wide. Small sized spider, dark brown or blackish in colour.
Cephalothorax somewhat oval, square fronted, dark brown in colour, lighter in middle and darker anteriorly and posteriorly, gently sloping backwardly, black markings present posteriorly giving it a dark appearance, fovea longitudinal, straight, lying behind PLEs at middle. Ocular area having long setae while short hairs present all over the carapace,

some black markings also present on ocular area giving it dark appearance. Eyes eight, in three rows (4,2,2), AME very large, ALE slightly smaller, both pairs directed forward, PME smaller than PLE, PME and PLE directed to the sides. Ocular area dark in colour, anterior eye row fringed with long, black hairs.

1 2

3 4

Figs. 1-4. *Habrocestum chikhaldarensis* sp. n. 1-2. Habitus. 1. dorsal view. 2. ventral view. 3-4. Epigyne. 3. dorsal view. 4. ventral view.
Abbreviations: AG = accessory gland, FD = fertilization duct, S = spermatheca.

Labium rounded and narrow at the apex, brown in colour with white apex, having tuft of setae at the apex, endites broadened distally and narrow posteriorly with scopula, brown in colour. Carapace smooth, oval, brown in colour, longer than broad. Sternum flat, ovoid, narrower posteriorly, light brown in colour, longer than wide, having some hairs. Leg formula is 4312 (Table 1), femora, patellae and tibiae are darker than trochanters, metatarsi and tarsi. Femur of leg I is stronger than others and different in shape. Femur of leg II and III has a white mark laterally. Femur of leg IV is longer than others, two tarsal claws with claw tufts, spines and setae are present on femur, patella, tibia and metatarsus.
Total length 8.53, cephalothorax 3.79 long, 2.91 wide, abdomen 3.82 long, 2.80 wide. MOQ trapezoid in shape, narrow anteriorly and broad posteriorly, L 0.65, W 2.09,

distance between PME and PLE 0.23, ALE and PLE 0.72, AME and ALE 0.13, AME and AME 0.16, PME and PME 1.63.
Abdomen oval in shape, longer than wide, dirty grey in colour with numerous marks, short hairs present all over the abdomen giving it a darker appearance, ventrally abdomen having lighter hairs with somewhat longitudinal band like marking centrally. Spinnerets short, three pairs, anterior and posterior pairs similar in length. A pair of book lungs present ventrally. Epigyne is 0.61 in length and 0.98 in width. Both the spermathecae are separated from each other and an inverted 'W' like structure present at the bottom.

Table 1. Leg measurements of *Habrocestum chikhaldarensis* sp. n. ♀.

Leg	Femur	Patella	Tibia	Metatarsus	Tarsus	Total
I	1.1	0.6	0.7	0.6	0.6	3.6
II	1.1	0.4	0.4	0.6	0.5	3.0
III	1.4	0.4	0.5	1.0	0.6	3.9
IV	1.4	0.3	0.6	1.4	0.6	4.3

Table 2. Spination of legs of *Habrocestum chikhaldarensis* sp. n. ♀.

	Leg I	Leg II	Leg III	Leg IV
Femur	D=5	D=6	D=6	D=5
Patella	-	-	Pl=2	Pl=2
Tibia	Pl=2, V=2	Pl=2, V=3	Pl=4, V=2	Pl=4, V=2
Metatarsus	Pl=2, V=2	Pl=2, V=2	D=4, Pl=2, V=4	D=6, Pl=2, V=4

Ecology and Habitat

These spiders run on the greasy lands, on rocky ground and hide under stones. In our study the studied specimen was collected by hand picking method.

Discussion and Conclusion

The present investigation shows that the description of morphometric measurement and other features are distinct from other species. The little change occurs in morphological characters like colour, size, spines on legs, etc. mainly it is differentiated from *H. longispinum* as the epigynum having the spermathecae separated from each other, different in shape, different oviducts, and an inverted 'W'-like structure at the bottom. The ocular region of *H. longispinum* contains five white dots, whereas in *Habrocestum chikhaldarensis* sp. n. these are absent.

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***Habrocestum chikhaldarensis* Rao, Bodkhe & Kanaujia, 2025**
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First record of *Hersilia nepalensis* M. Baehr & B. Baehr, 1993 (Araneae: Hersiliidae) from India

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Abstract

The two tailed spider species, *Hersilia nepalensis* M. Baehr & B. Baehr, 1993 was previously reported from Nepal. In this paper, we report this species for the first time from India based on a female specimen from Delhi.

Keywords: New report, *Hersilia nepalensis*, taxonomy, India.

Introduction

The spider family Hersiliidae Thorell, 1869 are entelegyne spiders, tropical and semi-tropical in distribution, that includes 16 genera and 187 species worldwide (World Spider Catalog, 2024). In India, this family is represented by three genera, *i.e. Hersilia* Savigny, 1825, *Murricia* Simon, 1882, and *Neotama* M. Baehr & B. Baehr, 1993 (World Spider Catalog, 2024). *Hersilia* is the largest genus in this family with 80 species worldwide and distributed in Afrotropical, Oriental, and Australian Regions (Foord & Dippenaar-Schoeman, 2006). Seven species of this genus are reported from India, *viz. Hersilia savignyi* Lucas, 1836, *H. sumatrana* (Thorell, 1890), *H. striata* Wang & Yin, 1985, *H. tibialis* M. Baehr & B. Baehr, 1993, *H. scrupulosa* Foord & Dippenaar-Schoeman, 2006, *H. longivulva* Sen, Saha & Raychaudhuri, 2010, and *H. orvakalensis* Javed, Foord & Tampal, 2010 (Lucas, 1836; Sinha, 1951, Baehr & Baehr, 1993; Sen *et al.*, 2010; Javed *et al.*, 2010; Talwar *et al.*, 2019; Caleb, 2020; World Spider Catalog, 2024).

In the present paper we report *Hersilia nepalensis* M. Baehr & B. Baehr, 1993 for the first time from India based on a female specimen collected from Sanjay Lake, Delhi. The species was confirmed based on distinct female genital characters that separate this species from other species, *i.e.* vulva shorter and wider, with markedly separated circular RS and pilose BS at base, BS smaller than RS, SD slightly thickened, curved and situated more laterally (Baehr & Baehr, 1993).

Material and Methods

The specimen was hand collected from tree bark and subsequently preserved in 70% ethanol and deposited in the research collections of the Guru Gobind Singh Indraprastha University, New Delhi, India. All measurements are in millimetres (mm) and were taken using LAS software equipped to a stereozoom microscope. Lengths of palp and leg segments were taken from the left side in dorsal aspect and are given as follows: total [femur, patella, tibia, metatarsus (absent in palp), tarsus]. Female genitalia were dissected and cleared in 10% KOH for 1 hour prior to examination. The microphotographic images were taken by a Leica DMC190 HD digital camera attached to a Leica M205A stereomicroscope, with the software package Leica Application Suite (LAS, version 3.8) used for stacking images taken at different focal planes.

Abbreviations used in the text are as follows: ALE = anterior lateral eye, ALS = anterior lateral spinneret, AME = anterior median eye, BS = bulbose sac, CO = copulatory opening, PLE = posterior lateral eye, PLS = posterior lateral spinneret, PME = posterior median eye, RS = receptaculum seminis, S = spermatheca, SD = seminal duct, and IPUM = Indraprastha University Museum.

Taxonomy

Hersiliidae Thorell, 1869

Hersilia Savigny, 1825

Hersilia nepalensis M. Baehr & B. Baehr, 1993

Material examined: One ♀**,** (IPUM), INDIA. Sanjay Lake, Delhi, 28°36’50.89”N, 77°18’24.07”E, 25 April, 2019, coll. Vikas Kumar Singh and Diksha, IPU 24-ARA-1598.

Description (Fig. 1A-F, 2A-B): Medium-sized spider (Fig. 1A-B); total length 5.27, carapace 2.24 long, 2.36 wide, abdomen 3.03 long, 2.57 wide. Cephalothorax: pale yellow (Fig. 1A). Eye area dark and depressed; eye sizes and interdistances: ALE 0.12, AME 0.21, PLE 0.16, PME 0.17; ALE–PLE 0.14, AME–AME 0.16, AME–PME 0.15, PME–PLE 0.20, AME-ALE 0.11, PME-PME 0.16, PLE-PLE 0.64, ALE-ALE 0.63, ALE-PME 0.18 (Fig. 1A,C,D). Thoracic region wider, dorso-ventrally flattened and covered with plumose setae, with indistinct longitudinal fovea and darkish radial striae on each half, lateral borders darker with row of conspicuous setae (Fig. 1A). Chelicerae elongate, almost twice as long as wide yellowish brown except basal part that is whitish (Fig. 1D), 3 promarginal teeth (2 large and one small) and 6 retromarginal teeth (subequal in size); clypeus fairly low, height 0.27, pale yellow with brownish patch (Fig. 1D). Sternum heart-shaped, yellowish, 1.23 long, 1.16 wide, with distinct precoxal sclerites between coxae II and III and III and IV, irregularly covered with hairs (Fig. 1E). Endite yellowish brown, anteriorly broad and tapers prolaterally, 0.37 long, 0.42 wide (Fig. 1B). Labium yellowish brown, semi-circular, 0.28 long, 0.50 wide (Fig. 1E). Abdomen dorsally yellowish white and mottled, anterior half bears a brown, lancet-shaped stripe, mid-dorsally 6 pairs of longitudinal pits, laterally unevenly thickened dark boarder (Fig. 1A). Abdomen ventrally light, small light brown dots forming a ring present in the region

prior to spinnerets (Fig. 1B). Palpi and legs annulate; length of pedipalp and legs: pedipalp 2.87 [1.07, 0.54, 0.40, 0.86], I 19.44 [5.73, 0.98, 4.99, 4.29, 3.45], II 18.44 [5.35, 0.89, 4.80, 4.18, 3.22], III 6.46 [2.04, 0.58, 1.41, 1.70, 0.73], IV 15.84 [4.49, 0.70, 3.83, 3.89, 2.93]; leg formula: 1243. Spinnerets: PLS inconspicuously annulate, PLS 3.24 long, ALS 0.66 long (Fig. 1F). Epigyne: Porus in middle appearing like two small dots, and a crescent-shaped stripe on each side (Fig. 2A). Internal genitalia: Moderately large and wide, posterior part at base in middle narrowly incised, S oval, SD tubular and thickened, RS circular, markedly separated, with large, medially rather angulate, pilose BS at base, BS smaller than RS, CO sclerotized appearing like two small dots in the middle (Fig. 2B).

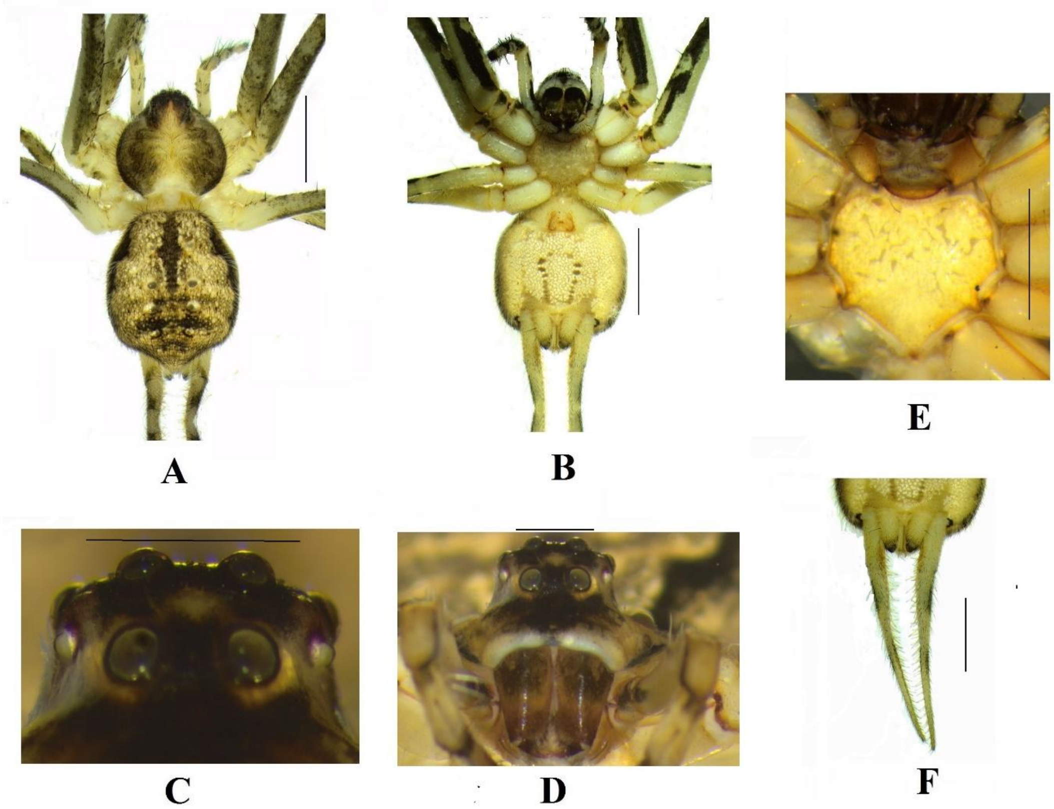

Fig. 1. *Hersilia nepalensis* M. Baehr & B. Baehr, 1993 ♀. A-B. Habitus. A. dorsal view. B. ventral view. C. Eyes arrangement. D. Eyes, clypeus, and chelicerae, frontal view. E. Sternum, labium, and endites. F. Spinnerets, ventral view. (Scale bars: A-B = 2 mm, C-D = 0.5 mm, E-F = 1 mm).

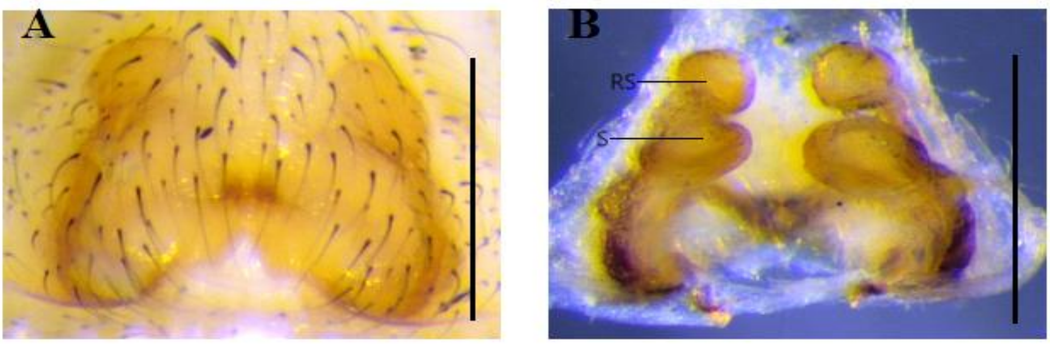

Fig. 2. *Hersilia nepalensis* M. Baehr & B. Baehr, 1993 ♀. A. Epigyne, ventral view. B. Internal genitalia, dorsal view. (Scale bar: A-B = 0.5 mm).

Natural history: The species was found on bark of tree at bank of Sanjay Lake (Fig. 3) that represents an urban water body. This species is a fast runner that doesn’t stay on a web.

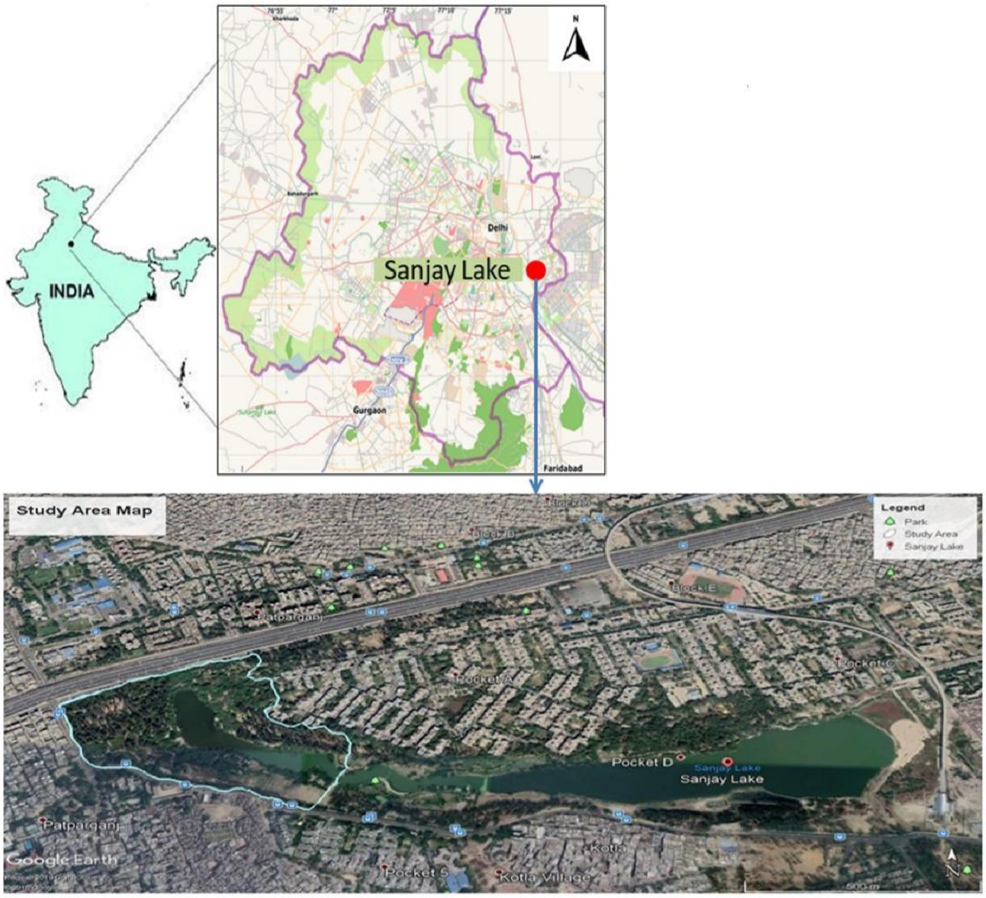

Fig. 3. Study site in NCT Delhi.

Distribution: Nepal and India (present record).

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New locality record of *Prodidomus amaranthinus* (Lucas, 1846) (Araneae: Gnaphosidae) in Türkiye

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Abstract

Prodidomus amaranthinus (Lucas, 1846) is known from the Mediterranean region of Türkiye. In this study, we collect this species from new locality in Aegean region of Türkiye. General habitus and genitalia of both sexes are illustrated.

Keywords: Araneae, *Prodidomus amaranthinus*, new locality, Anatolia.

Introduction

Prodidomidae Simon, 1884 is a widespread family, including 24 genera and 195 species distributed worldwide. Among them, species belonging to genus *Prodidomus* Hentz, 1847, which has almost worldwide distribution, includes 54 known specie (World Spider Catalog, 2025). In Türkiye, only two species of genus *Prodidomus* were recorded: the female *P. redikorzevi* Spassky, 1940 by Kunt *et al.* (2012) in Şanlıurfa province in south-eastern Anatolia region and *P. amaranthinus* (Lucas, 1846) by Topçu & Türkeş (2010) in Mersin and Antalya Provinces in Mediterranean region of Türkiye (Fig. 1).

This study provides new data on the distribution of *P. amaranthinus* in Türkiye and expands the distribution area of the species.

Material and Methods

In this study, three males and two female specimens were collected from Mersin province (Mediterranean region) and Muğla Provinces (Aegean region) in southern part of Anatolia. Examined specimens were preserved in 70% ethanol and deposited in the

Niğde Ömer Halisdemir University Arachnology Museum (NÖHUAM). For identification, Topçu & Türkeş (2010) and Kunt *et al.* (2012) were consulted. The identification was made by means of a SZX61 Olympus stereomicroscope.

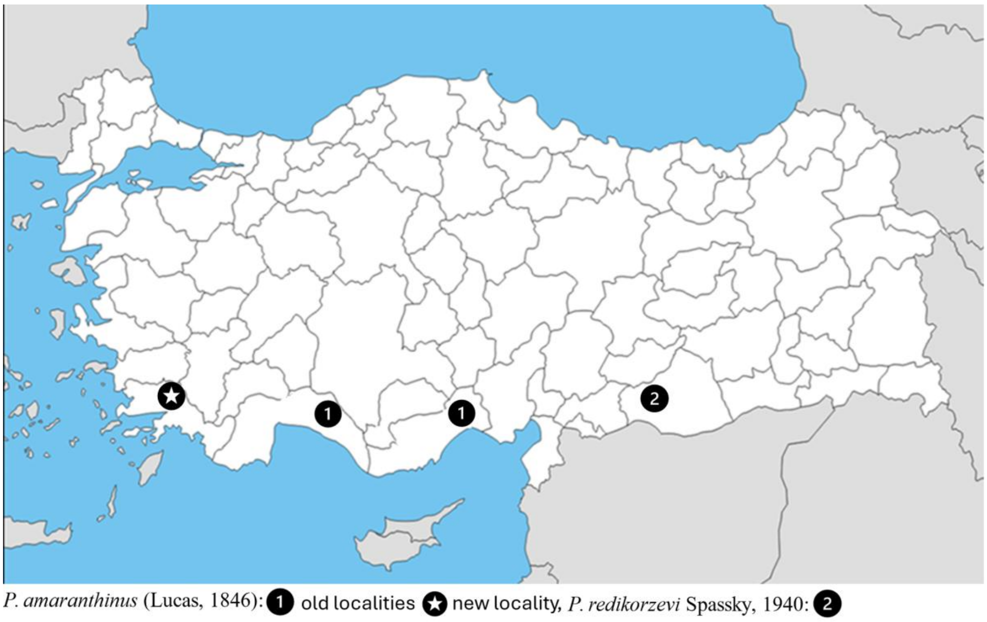

Fig 1. Localities of genus *Prodidomus* Hentz, 1847 in Türkiye.

Results

Prodidomus amaranthinus (Lucas, 1846) Figs. (2-3)

Collected specimens: 2♂♂, 1♀ Türkiye: Mersin Province, Gülnar district, elevation nearly 930 m, 07.VIII.2023, *leg.* Osman Seyyar. 1♂, 1♀ Muğla Province, Dalaman District, elevation nearly 350 m, 21.VIII.2023, *leg.* Osman Seyyar, found under forest debris.

Fig. 2. *Prodidomus amaranthinus* (Lucas, 1846), female. A. Habitus. B. Epigyne.

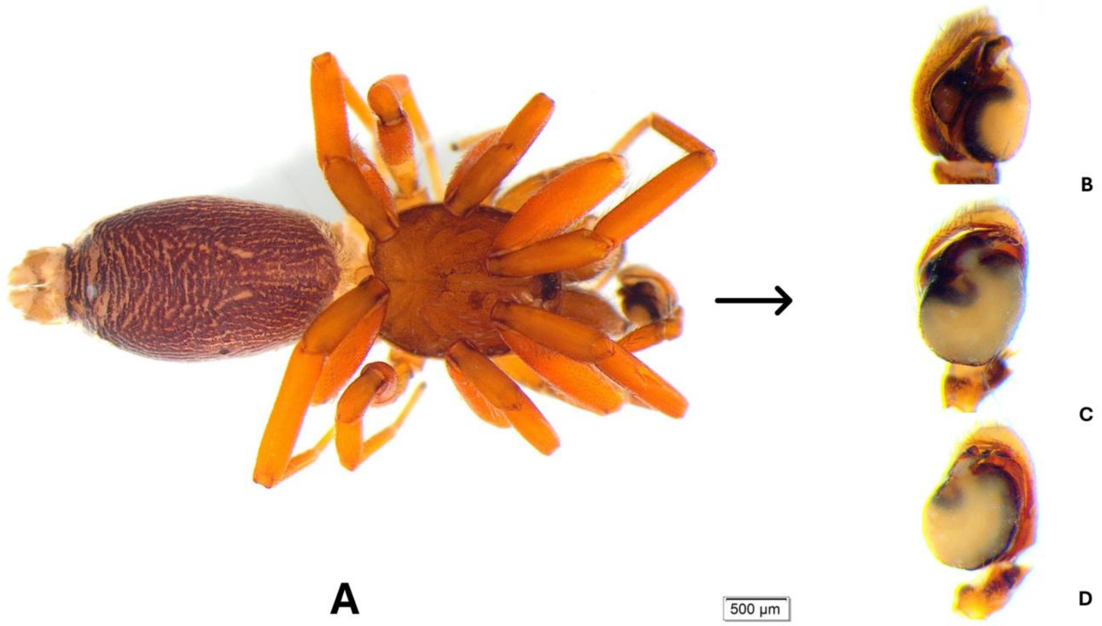

Fig. 3. *Prodidomus amaranthinus* (Lucas, 1846), male. A. Habitus. B-D. Palp. B. prolateral view. C. ventral view. D. retrolateral view.

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New locality record of *Eresus lavrosii* Mcheidze, 1997 (Araneae: Eresidae) in Anatolia

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Abstract

Eresus lavrosii Mcheidze, 1997 is known in Türkiye only from the Kars province, eastern of Türkiye. In this study, we could find this species from a new locality in Central Anatolia of Türkiye. General habitus and male genitalia of this species are illustrated.

Keywords: Araneae, *Eresus lavrosii*, new locality, Anatolia.

Introduction

The Eresidae, commonly known as velvet spiders is a relatively small family of spiders, including 9 genera and 109 species distributed in the world. Among them, genus *Eresus* Walckenaer, 1805 is the largest genus in the family, including 25 known species and 5 subspecies (World Spider Catalog, 2025). In Türkiye, four species of this genus were already recorded: *Eresus kollari* Rossi, 1846, *E. lavrosii* Mcheidze, 1997, *E. sandaliatus* (Martini & Goeze, 1778) and *E. walckenaeri* Brullé, 1832 (Demir & Seyyar, 2017; Danışman *et al.*, 2025). Among these species, male specimens of *E. lavrosii* have been recently collected from Kars province in eastern Türkiye. This is a new locality record from the Niğde province in the Central Anatolia Region of Türkiye.

The aim of this paper is to present a new locality record of the eresid spider *E. lavrosii* in Türkiye widening its distribution in the country (Fig. 1).

Material and Methods

In this study, two male specimens of *Eresus lavrosii* Mcheidze, 1997 were collected from Niğde province in Central Anatolia. Examined specimens were preserved

in 70% ethanol and deposited in the Niğde Ömer Halisdemir University Arachnology Museum (NÖHUAM). For identification, Zamani *et al.* (2020) was consulted. The identification was made by means of a SZX61 Olympus stereomicroscope.

Fig 1. Localities of *Eresus lavrosii* Mcheidze, 1997 in Türkiye.

Results

Eresus lavrosii Mcheidze, 1997   Figs. (2-5)

Collected specimens: 1♂, **Türkiye: Niğde Province**: İtulumaz Mountain, elevation nearly 1250 m, 15.VI.2024, *leg.* Cihat Kara. 1♂, Bahçeli Town, Kemerhisahar, Bor elevation nearly 1220 m, 02.VI.2023, *leg.* Osman Seyyar, collected randomly while active moving.

Description: see Zamani *et al.* (2020). Habitus (Figs. 2-3). Male palp (Figs. 4-5).

Fig. 2. Digital photo of *Eresus lavrosii* Mcheidze, 1997 among plants.

Fig. 3. Habitus of male *Eresus lavrosii* Mcheidze, 1997. A. dorsal view. B. ventral view.

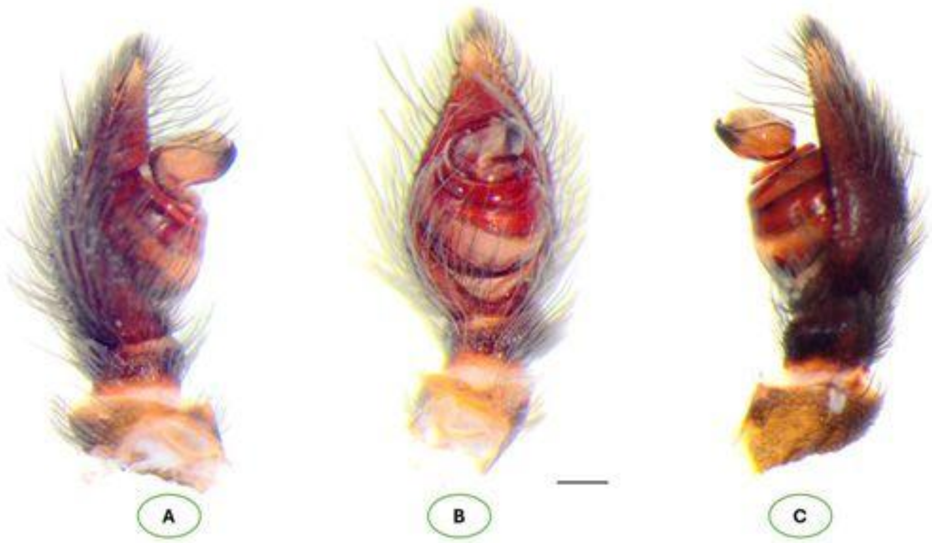

Fig. 4. Male palp of *Eresus lavrosii* Mcheidze, 1997. A. prolateral view. B. ventral view. C. retrolateral view.

Fig. 5. Male palp conductor of *Eresus lavrosii* Mcheidze, 1997. A. prolateral view. B. ventral view. C. retrolateral view.

Acknowledgment

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First report of *Haplodrassus tegulatus* (Schenkel, 1963) (Araneae: Gnaphosidae) in Türkiye

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Abstract

This study reports one gnaphosid species record for the Turkish araneo-fauna. The characteristic features and photographs of *Haplodrassus tegulatus* (Schenkel, 1963) are presented. The distribution of this species in Türkiye is also mapped.

Keywords: Araneae, Gnaphosidae, *Haplodrassus tegulatus*, new record, Türkiye.

Introduction

Gnaphosidae Banks, 1892 is the fifth largest spider family with 2494 described species in 153 genera distributed worldwide (World Spider Catalog, 2025). The genus *Haplodrassus* Chamberlin, 1922 is represented by 101 species in this family (World Spider Catalog, 2025). It is represented by 42 species in Europe (Nentwig *et al.*, 2025). Until now, 163 gnaphosid species that belong to 34 genera have been reported from Türkiye (Danışman *et al.*, 2025), including 14 species assigned to genus *Haplodrassus*. The genus *Haplodrassus* differs from other gnaphosid genera by the presence of a palp with relatively long, keels-bearing retrolateral tibial apophysis, with a tegulum bearing the median apophysis (MA) on its prolateral side in males, and the presence of an epigynum with a large atrium usually containing several folds, sclerotized anterior margins or rarely a single sclerotized margin (hood) in females. *Haplodrassus tegulatus* was described from Gansu (in central China as Kansu) by Schenkel (1963). Later it was

recorded from Russia (Tuva Republic, South Siberia) by Marusik & Logunov (1995). This paper presents the distribution and characterisation of *Haplodrassus tegulatus* (Schenkel, 1963) (♀), as a new addition to the araneofauna of Türkiye. With this new record, the family Gnaphosidae in Türkiye increases to 164 species of 34 genera and 15 species of genus *Haplodrassus*.

Material and Methods

Two female specimens were examined in this study. Samples were collected from Siirt province located in the South-eastern Anatolia region of Türkiye. The specimens were collected with the help of a hand aspirator. Identification was made by use of Leica S8APO stereomicroscope. Samples were photographed using a Canon EOS 250D camera attached to a Leica S8APO stereomicroscope. The female genitalia was dissected and cleared in an 88% lactic acid solution for 12-48 hours at room temperature, then immersed in 80% ethanol for photographs and preservation. Images were montaged using Combine ZM image tacking software and processed by Photoshop CC 2019. Specimens were preserved in 70% ethanol. The identification was based on the keys of Murphy (2007) and Nentwig *et al.* (2025). The map in this study was generated with the online tool SimpleMappr (Shorthouse, 2010) (Fig. 10). Abbreviations used in the text are as follows: Fe = femur, Pa = patella, Ti = tibia, Mt = metatarsus, Ta = tarsus. All measurements are given in millimetres. Specimens are deposited in the collection of the Arachnological Museum of Kırıkkale University (KUAM).

Results

Family **Gnaphosidae** Banks, 1892

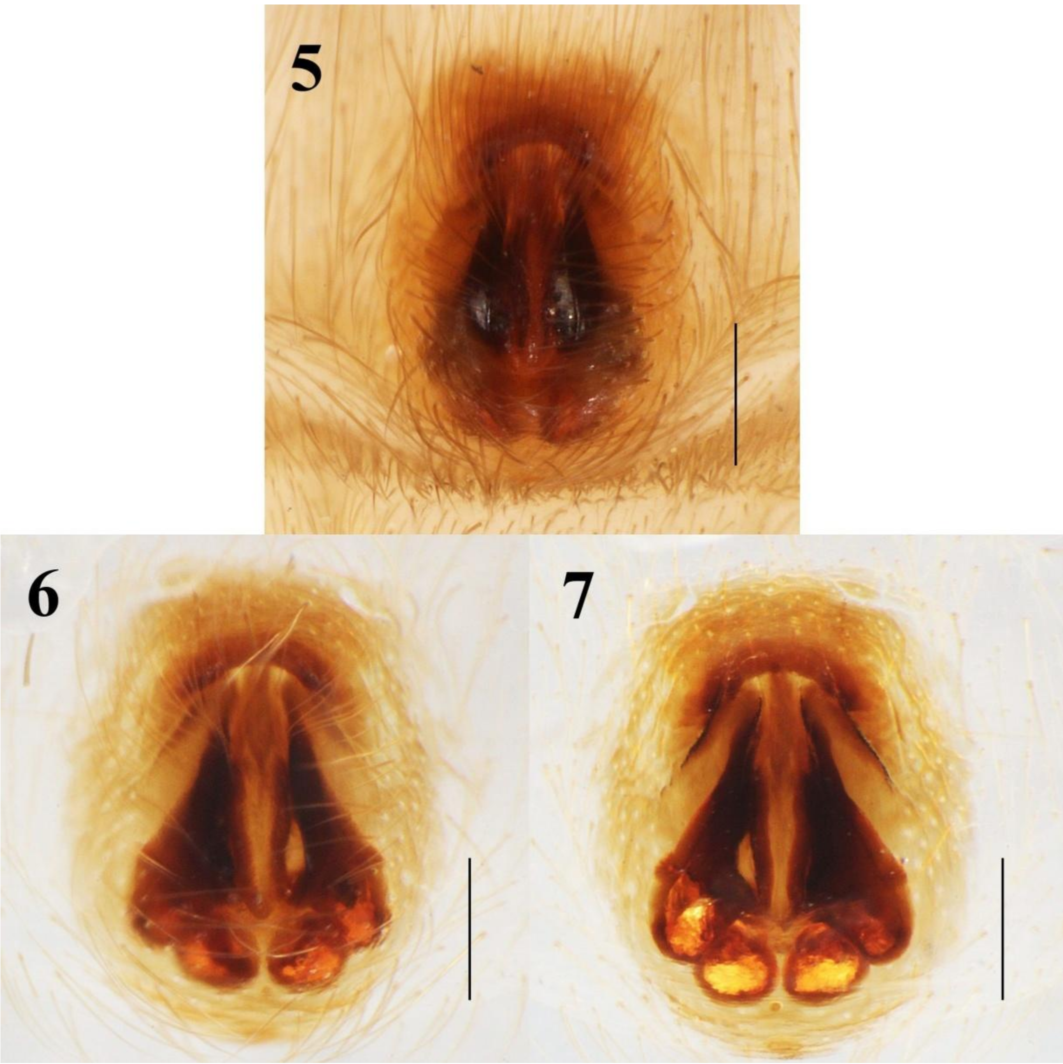
Genus ***Haplodrassus*** Chamberlin, 1922

Haplodrassus tegulatus (Schenkel, 1963)

Material examined: 2♀♀, Türkiye, Siirt Province, Baykan District, 38°09'29"N, 41°46'40"E, elev. 717 m, 17.11.2010, *leg.* E.A. Yağmur.

Figs. 1-4. *Haplodrassus tegulatus*, habitus, female. 1. dorsal view. 2. ventral view. 3. frontal view. 4. ocular area, dorsal view. (Scale: 1.0 mm).

Female. Measurements: Total length 9.4. Prosoma length 3.6, width 2.8. Abdomen length 5.8, width 3.8. Ocular area length 0.9. Chelicera length 1.7, width 0.9. Sternum length 2.1, width 1.6. Leg formula IV-I-II-III. Lengths of legs' segments: Leg I: Fe 2.1, Pa 1.0, Ti 1.6, Mt 1.1, Ta 0.9, Total 6.7; Leg II: Fe 1.7, Pa 0.9, Ti 1.4, Mt 1.1, Ta 0.9, Total 6.0; Leg III: Fe 1.6, Pa 0.8, Ti 1.1, Mt 1.0, Ta 0.7, Total 5.2; Leg IV: Fe 2.2, Pa 1.0, Ti 1.8, Mt 1.7, Ta 1.0, Total 7.7. Prosoma light yellow (Fig. 1). Its anterior part yellowish brown (Figs. 1,4). Clypeus narrow, brown (Fig. 3). Chelicerae long, dark brown, dorsally with long dark setae (Fig. 3). Sternum yellow, with setae and edges dark (Fig. 2). Labium and maxillae dark brown (Fig. 2). Abdomen whitish yellow, covered with short hairs. Its anterior part is covered with long dark hairs (Fig. 1), ventrally whitish yellow (Fig. 2).



Figs. 5-7. *Haplodrassus tegulatus*, female, epigyne. 5-6. ventral view. 7. dorsal view. (6 and 7 after maceration) (Scale: 0.2 mm).

While legs metatarsus and tarsus segments brown, other segments dark yellow and all segments covered with black hairs (Figs. 1-2). Spinnerets light yellow (Figs. 1-2). Fovea with parallel margins. The sclerotized anterior ridge of the epigyne forms a hood or pocket. Spermathecae are oval and very close to each other (Figs. 5-7).

Habitat: The specimens were found under stones and collected using an aspirator. The collecting site is in a valley with a water stream, making it a relatively humid environment. The habitat consists of a steppe area with oak bushes (Figs. 8-9).

Distribution: Russia (South Siberia), China (World Spider Catalog, 2025).

Figs 8-9. Habitat of *Haplodrassus tegulatus*.

Fig. 10. Distribution map of *Haplodrassus tegulatus* (red star) in Türkiye.

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About the presence of *Steatoda maura* (Simon, 1909) in Türkiye (Araneae: Theridiidae)

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Abstract

Steatoda maura (Simon, 1909) was previously recorded from Türkiye based on a subadult specimen. Now, an adult male and a subadult female were collected from İzmir province in the Aegean region of Türkiye. The presence of the species in Türkiye is confirmed and a point record is given. In addition, habitus photographs of the female and photographs and drawing of the male's copulatory organs are included.

Keywords: Spider, checklist, fauna, Mediterranean.

Introduction

The last author received the following email from our colleague Mr. Tobias Bauer on 2 February 2018:

> *Dear Mr. Kunt,*
>
> *I have a small addition for the Turkish spider checklist. Steatoda maura (Simon, 1909) is listed in Wiehle (1934) sub. Lithyphantes gerhardti from İzmir (named Smyrna there), at the very end of the article. I've already sent this information to araneae.unibe.ch, so there S. maura is already listed for Türkiye.*
>
> *All the best,*

Unfortunately, this significant and considered email was overlooked and subsequently entirely forgotten. In fact, *Steatoda maura* is absent from the current checklist of spiders in Türkiye (Danışman *et al.*, 2025) and has not been listed in any checklist published to date (Karol, 1967; Topçu *et al.*, 2005; Demir & Seyyar, 2017).

S. maura specimens were collected from İzmir again in late 2024 to remind us of Mr. Bauer's email. Thereupon, we wanted to re-evaluate the presence of the species in Türkiye because the record of Wiehle (1934) was based on a sub-adult specimen. As a matter of fact, in the related article, the author explained the situation as follows:

> Über die Verbreitung der Art kann ich wenigstens einige Angaben machen. Wie ich schon in der Einleitung berichtete, erhielt ich ein befruchtetes Weibchen aus Palästina. Als ich 1933 Tiere mit Jugendfärbung, reife Männchen und Weibchen Herrn L. FAGE nach Paris sandte, teilte er mir freundlichst mit, daß er in der Sammlung ein unreifes Stück besitze, das zweifellos zu meiner Art gehöre und in Smyrna erbeutet worden sei. Herr W. S. BRISTOWE sandte mir zum Zwecke der Bestimmung einige Spinnen zu, die er im Juni 1933 in Griechenland gesammelt hatte. Unter diesen befand sich ein reifes Weibchen von *L. gerhardti,* das bei Athen gefunden worden war. So steht also bis jetzt fest, daß *Lithyphantes gerhardti* in Palästina, Kleinasien und Griechenland vorkommt.

> "When I sent animals with juvenile colouration, along with mature males and females, to Mr L. Fage in Paris in 1933, he kindly informed me that he had an immature specimen in his collection which undoubtedly belonged to my species and had been captured in Smyrna" (Wiehle, 1934; page 83).

This short paper aims to confirm the presence of *S. maura* in Türkiye. Photographs and drawing of the male of this species are given in the paper too.

Material and Methods

Samples were hand-collected from the vegetation and preserved in 70% ethyl alcohol. All specimens are deposited in the Arachnological Museum of Kırıkkale University (KUAM).

Photographs were taken using a Leica S8APO microscope with a Canon 250D camera. Images were montaged using "Combine-ZM" image stacking software. Figure 1D was digitally created using the tablet-based drawing software Procreate® 5.3.14 (Savage Interactive Pty Ltd.). Van Keer *et al.* (2024) was used for species identification.

Taxonomy

Family **Theridiidae** Sundevall, 1833

Genus ***Steatoda*** Sundevall, 1833

Steatoda maura (Simon, 1909)

Fig. 1

Lithyphantes maurus, Simon (1909): 23 (D♀).
Lithyphantes gerhardti, Wiehle (1934): 71, Figs. 3, 6-8 (D♂♀).
Steatoda maura, Levy & Amitai (1982): 21, Figs. 33-41 (♂♀, Synonym of *Steatoda gerhardti*).

Steatoda maura, Levy (1998): 67, f. 123-130 (♂♀).
Steatoda maura, Le Peru (2011): 466, f. 786 (♂♀).
Steatoda maura, Van Keer, Bosselaers & Oger (2024): 19, Figs. 23A-G, 24A-F (♂♀).

Material examined: 1♂, 1♀ (subadult), İzmir province, Bornova district (38°28'7.36''N, 27°11'48.27''E), 30 m, 29 October 2024, *leg*. A. Karakuş.

Description: The female habitus is given in Figs. (1A-B), and images of the male copulatory organ are shown in Figs. (1C-E). For more detailed descriptions of male and female, see Van Keer *et al.* (2024).
General Distribution: Morocco, Greece, Türkiye, Palestine/Israel, Iran (World Spider Catalog, 2025).

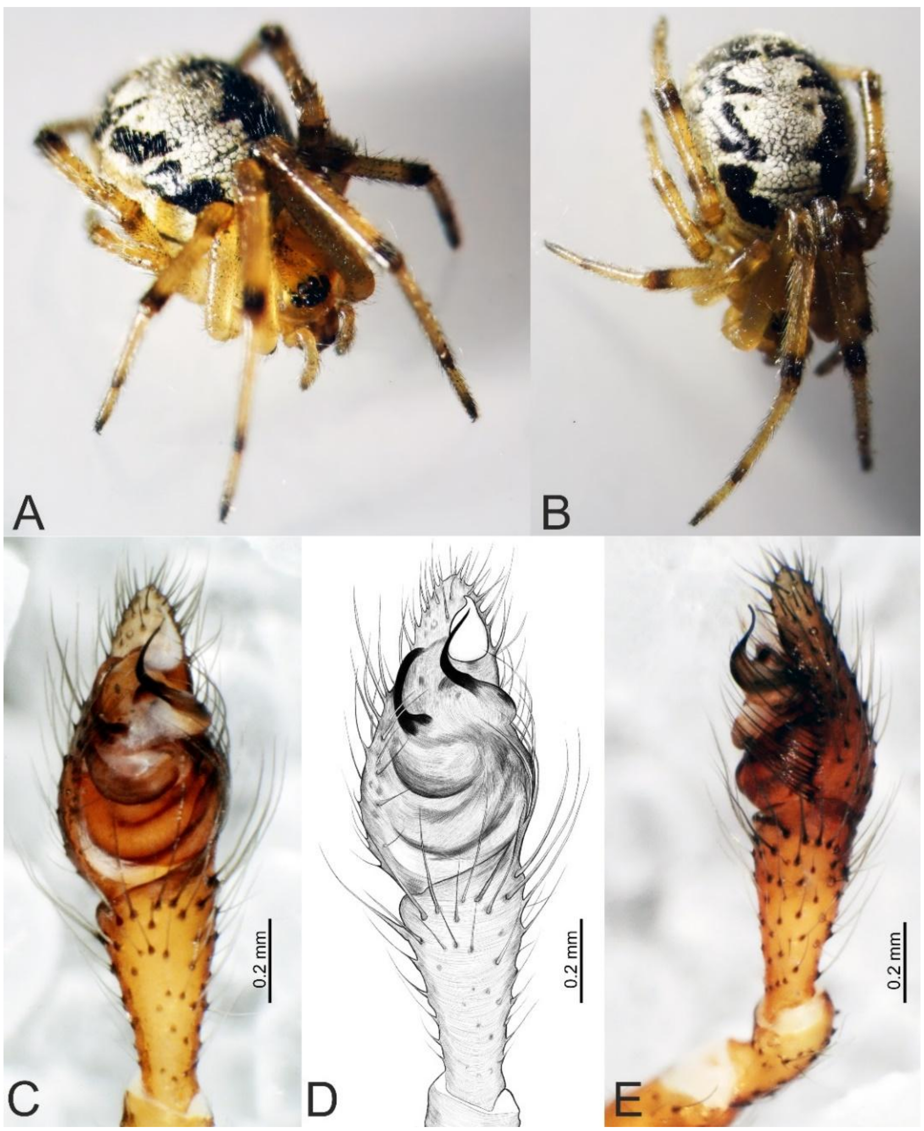

Fig. 1. *Steatoda maura* (Simon, 1909). A-B Subadult female, habitus. C-E. Male palp. C-D. ventral view. E. retrolateral view.

Karol (1967) published the first checklist of Turkish spiders. In this study, she reported 302 spider species from Türkiye. After 35 years, Bayram (2002) and Topçu *et al.* (2005) successively updated this checklist. In the list published in 2005, the checklist of spiders of Türkiye consisted of 613 species. Today, this number is close to 1300 species. In other words, species have increased more than four times since 1967.

Given that access to the internet and, consequently, to scientific information and related literature has become widespread in Türkiye since the early 2000s, we can acknowledge that some spider species were erroneously included or excluded from the list during this relatively long period.

Another issue is the presence of species that require confirmation. For example, Roewer (1959) recorded *Hersiliola* Thorell, 1869 at the genus level from Diyarbakır, Hatay and Mardin. Although this record was first misidentified as *H. macullulata* (Dufour, 1831) by Yağmur *et al.* (2008), the existence of the genus in Türkiye was confirmed. Then, it was described as a new species, *H. turcica* Marusik, Kunt & Yağmur, 2010 (Marusik *et al.*, 2010). There are many examples of similar situation, and *S. maura* is one of them.

With the confirmed inclusion of *S. maura* in Türkiye's spider checklist, the number of *Steatoda* species in Türkiye has increased to ten. These are: *S. albomaculata* (De Geer, 1778); *S. bipunctata* (Linnaeus, 1758); *S. castanea* (Clerck, 1757); *S. dahli* (Nosek, 1905); *S. erigoniformis* (O. Pickard-Cambridge, 1872); *S. grossa* (C.L. Koch, 1838), *S. maura* (Simon, 1909); *S. nobilis* (Thorell, 1875); *S. paykulliana* (Walckenaer, 1806) and *S. triangulosa* (Walckenaer, 1802). Considering the zoogeographical position of Türkiye in the Mediterranean basin, it is not wrong to expect that the number of species may increase even more.

Acknowledgment

Thanks to our colleague Mr. Tobias Bauer (Karlsruhe, Germany) for his kind message in 2018.

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A seven-legged theraphosid spider: appendicular teratology in *Nhandu coloratovillosus* (Schmidt, 1998) (Araneae: Theraphosidae)

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Abstract

A seven-legged specimen of the theraphosid *Nhandu coloratovillosus* (Schmidt, 1998) is reported and documented with photographs. It is a rare case of congenital anomaly.

Keywords: Spider, Theraphosidae, tarantula, *Nhandu coloratovillosus*, anomaly, teratology.

Introduction

In the context of studying spider behaviour and development in captivity, I purchased a specimen of *Nhandu coloratovillosus* (Schmidt, 1998), a terrestrial tarantula species belonging to the family Theraphosidae Thorell, 1869, widely distributed in Brazil (World Spider Catalog, 2025), for the purpose of long-term observation (Fig. 1). This species was originally described under the name *Brazilopelma coloratovillosum* Schmidt, 1998 before being reclassified into the genus *Nhandu* Lucas, 1983 (Bertani, 2001).

Upon acquisition, I noticed that the spider had only seven legs instead of the usual eight. I initially assumed that the missing eighth leg would develop during subsequent moulting cycles. When theraphosid spiders autonomise legs due to injury, they regenerate over subsequent ecdyses (Baerg, 1958). However, after each moult, I observed no growth of a new leg.

In this work, the results of my further investigation are presented, which revealed the absence of the right-hand leg IV was a result of teratology.

Material and Methods

The captive-bred specimen was purchased at the third instar, and was reared in a terrarium appropriately sized to accommodate the spider's body dimensions and activity needs. The enclosure was designed with a balanced substrate depth and the inclusion of a suitable hide, both of which are essential for reducing stress and supporting natural behaviour. The spider was kept in Alexandria, Egypt, under ambient room temperature conditions. Continuous substrate moisture was maintained through regular misting to simulate the natural humidity levels of the species' native habitat. This environmental consistency contributed to the spider's willingness to feed and successfully moult without interruption. During captivity, it underwent six additional moults, all of which were documented and are presented in the following table, including the dates and approximate ambient temperatures during each moulting month (Table 1).

Table 1. Data on ecdysis of teratological specimen of *Nhandu coloratovillosus*. * Derived from monthly temperature ranges in Alexandria, Egypt from Weather Spark (2025).

Moults	Instars	Moult date	Approximate temperature *
1	Reached the fourth instar.	January 2020	9-18°C
2	Reached the fifth instar. (Fig. 4)	March 2020	13-19°C
3	Reached the sixth instar.	February 2021	13-19°C
4	Reached the seventh instar.	June 2022	21.4-29.2°C
5	Reached the eighth instar.	October 2023	21.1-27.2°C
6	Reached the ninth instar.	August 2024	23.1-30.4°C

Fig. 1. *Nhandu coloratovillosus* specimen in its terrarium.

Fig. 2. Idem, ventral view showing the total absence of the right-hand leg IV.

Results

To investigate further, I placed the spider on a transparent glass surface to examine its ventral side closely. Upon inspection, I found that there was no coxa or resulting structures on the right-hand side of the specimen where leg IV should exist (Fig. 2). Thus, I confirmed that the leg was congenitally absent. Additionally, it was noted that the coxae on the right side had slightly increased in width, probably to compensate for the missing leg. This adaptation appears to restore the spider's balance, although this anomaly caused a slight tilt in the prosoma compared to the normal alignment (Fig. 3).

This observation indicates a genetic anomaly rather than prior injury, providing a unique case for documentation and future study within the genus *Nhandu*. Despite this morphological deviation and the slight body tilt, the spider demonstrated no apparent impairment in its ability to hunt, feed, or exhibit normal behaviour activities.

Fig. 3. The tilt appearance of the prosoma due to the absence of the right-hand leg IV.

Fig. 4. *Nhandu coloratovillosus* specimen during moulting process, reaching the fifth instar (March 2020).

Discussion

Research on the causes of leg anomalies in spiders is relatively scarce, with few studies addressing this specific topic. However, a study by Napiórkowska *et al.* (2015) explored various morphological and anatomical changes related to leg anomalies in *Tegenaria atrica* (C.L. Koch, 1843). The authors noted that leg anomalies, including the loss of legs, can occur due to genetic mutations, developmental disruptions, or environmental factors such as temperature fluctuations. In cases of leg loss, the corresponding ganglia (nerve centres controlling the legs) were often absent, suggesting a congenital defect occurring during early developmental stages. Additionally, environmental stresses, such as extreme or fluctuating temperatures, were also proposed as contributing factors.

Supporting this, field observations from Egypt have documented rare cases of leg anomalies. El-Hennawy (2002) reported the first case of a seven-legged spider involving a female *Larinioides suspicax* (O. Pickard-Cambridge, 1876) (Family Araneidae) collected from Ras El-Barr on the Mediterranean coast. This specimen exhibited only three legs on the left side instead of the normal four, with a complete absence of the third leg and its corresponding coxa. Remarkably, despite this deformity, the spider was capable of building normal webs and reproducing successfully, and all offspring appeared morphologically normal, indicating that the defect was not inherited. Furthermore, El-Hennawy (2007) documented a second case involving a male *Artema atlanta* Walckenaer, 1837 (Family Pholcidae) collected from Burg El-Arab area, west of Alexandria. This

specimen also had only three legs on the left side, but with an unusual fusion -only one leg replacing the normal positions of the first and second legs. As with the previous case, this anomaly did not appear to impair the spider's general biological functions.

These field reports reinforce the hypothesis that congenital developmental errors, possibly influenced by environmental conditions, can result in such rare anomalies without necessarily affecting survival or reproduction. Thus, the loss of a leg in a spider, such as observed in the present case of *N. coloratovillosus*, could similarly be attributed to congenital developmental disruptions or environmental stressors during embryogenesis.

The seven-legged *N. coloratovillosus* specimen presents a rare case of a congenital anomaly, where the missing leg appears to be a genetic defect rather than a developmental issue. Despite this, the spider showed no impairment in its ability to hunt, feed, or exhibit normal behaviour. This case highlights the adaptability of tarantulas to limb abnormalities and suggests that such anomalies can arise from genetic factors, environmental stress, or developmental disruptions. The study emphasizes the need for further research on leg anomalies and their effects on the survival and reproduction of spiders.

Acknowledgments

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Drassodes albicans (Simon, 1878) (Araneae: Gnaphosidae), a new record from Türkiye

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Abstract

The gnaphosid spider species *Drassodes albicans* (Simon, 1878) is recorded for the first time from Türkiye. Its morphology is briefly described and illustrated.

Keywords: Araneae, Gnaphosidae, *Drassodes albicans*, new record, systematics, Türkiye.

Introduction

Genus *Drassodes*, includes 134 species (World Spider Catalog, 2025); 43 of which are found in Europe (Nentwig *et al.*, 2025). In Türkiye, there are 166 species belonging to 35 genera in family Gnaphosidae (Danışman *et al.*, 2025). With the new data, the number of species belonging to the genus *Drassodes* in Türkiye has increased to 12 and the number of species belonging to family Gnaphosidae to 167.

Material and Methods

One female specimen was examined in this study. It was collected by means of a hand aspirator. Identification was made by use of Leica S8APO stereomicroscope. Digital images were created using a Canon EOS 250D camera attached to Leica S8APO microscope. Images were montaged using “CombineZM” image stacking software and

"Photoshop CS5" image editing software. The studied specimen is preserved in 70% ethanol and deposited in the collection of the Arachnological Museum of Kırıkkale University (KUAM).

Abbreviations used: Fe = femur, Pa = patella, Ti = tibia, Mt = metatarsus, and Ta = tarsus. All measurements are given in millimetres. Identification depended on Chatzaki *et al.* (2002).

Results

Family **Gnaphosidae** Banks, 1892
Genus ***Drassodes*** Westring, 1851
Drassodes albicans (Simon, 1878)

Material examined: 1♀, Türkiye, Sivas province, Altınyayla district, Doğupınar village 39°18'05.5"N, 36°40'54.4"E, 21.09.2024, found under stone, hand collecting, *leg*. T. Danışman and E. Birer alt. 1530 m.

Distribution: North Mediterranean (France, Greece, Italy, Spain) and Georgia (World Spider Catalog, 2025); Nentwig *et al.*, 2025).

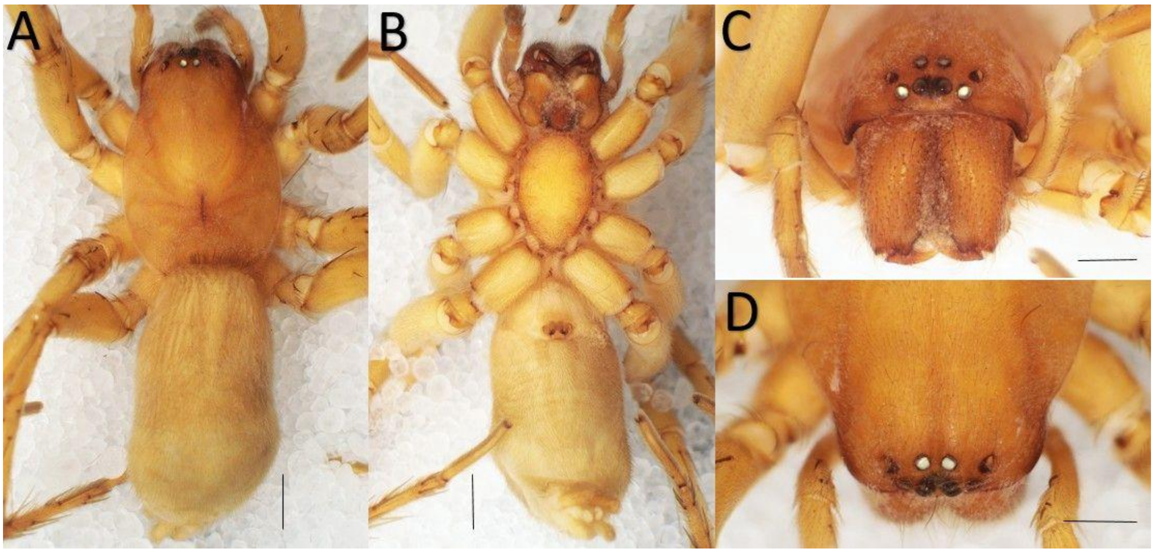

Fig. 1. *Drassodes albicans* (Simon, 1878), female, habitus. A. dorsal view. B. ventral view. C-D. Prosoma. C. frontal view. D. ocular area, dorsal view. (Scale bars: A-B. 1.0 mm, C-D. 0.5 mm).

Description:
Female. Measurements: Total length 9.5, Carapace 4.4 long, 4.0 wide. 3.1, Abdomen 5.1 long, 2.9 wide. Ocular area 0.8 long. Chelicerae 1.5 long, 0.8 wide. Sternum 2.3 long, 1.6 wide. Epigyne 0.6 long. Leg formula IV-I-II-III. Leg lengths: I 10.6 (Fe 3.0, Pa 1.5, Ti 2.6, Mt 2.0, Ta 1.5), II 10.4 (Fe 2.9, Pa 1.5, Ti 2.5, Mt 2.0, Ta 1.5), III 9.4 (Fe 2.7, Pa 1.2, Ti 2.2, Mt 2.0, Ta 1.3), IV 13.5 (Fe 3.6, Pa 1.7, Ti 3.0, Mt 3.5, Ta 1.7).
Prosoma light brown, fovea distinct (Fig. 1A). Abdomen yellow, covered with shiny light brown to grey-brown hairs. Sternum yellow-brown, with darker margins (Fig. 1B). Chelicerae light brown, with 3 retromarginal closely spaced teeth (central tooth larger than others) and 1 small promarginal tooth (Fig. 1C, 2). Legs and spinnerets yellow. Labium and maxillae brown with intensely hairy (Fig. 1-B). Cephalic region slightly

narrowed and elevated anteriorly, appearing slightly darker (Fig. 1D). Anterior half of the epigyne bears lateral depressions that do not reach the epigastric furrow. Spermathecae lie almost straight, also appearing bent and separated behind lateral depressions. Epigyne broad and contains a trapezoid-shaped septum. The septum narrows anteriorly and becomes more distinct in the median region (Fig. 3A-B).

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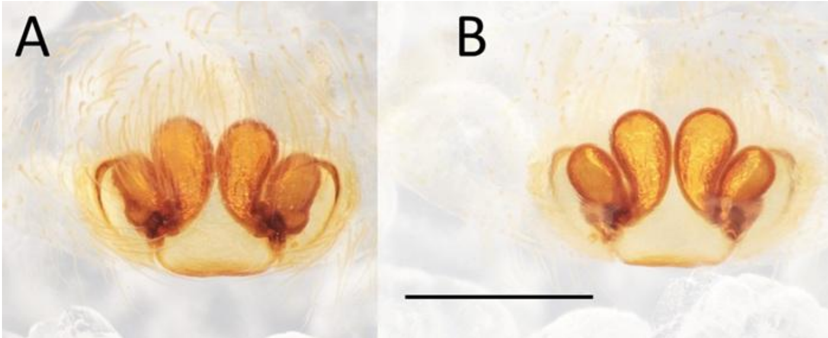
3 

Fig. 2. Cheliceral teeth of *Drassodes albicans* (Simon, 1878), female (Scale bar: 0.5 mm).

Fig. 3. *Drassodes albicans* (Simon, 1878), female, epigyne, A. ventral view. B. dorsal view. (Scale bar: 0.2 mm).

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Lycosoides coarctata (Dufour, 1831) in Jordan (Araneae: Agelenidae), with updated list of the known records of spiders from Jordan

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Abstract

Lycosoides coarctata (Dufour, 1831) of family Agelenidae is recorded from Jordan for the first time. Three adult male specimens and two juveniles of this species were collected in November 2011 inside a house in Amman, Jordan. This is the first record of family Agelenidae in Jordan too. Its illustrations and measurements are presented.

An updated list of the known records of spiders from Jordan is presented. The list includes 18 families, 33 genera, and 39 species of spiders in Jordan.

Keywords: Araneae, Agelenidae, *Lycosoides coarctata*, Jordan.

Introduction

Family Agelenidae C.L. Koch, 1837 is a medium family of 97 genera and 1430 species worldwide distributed (World Spider Catalog, 2025).

Genus *Lycosoides* Lucas, 1846 includes 15 species mainly recorded from Mediterranean/North African countries (Spain, Morocco, Algeria, Tunisia, Malta, Italy) in addition to Canary Is., Georgia, and Azerbaijan. It is characterized by high endemism; 10 species of 15 are endemic: 7 in Morocco, 2 in Algeria, and 1 in Tunisia.

Diagnostic and descriptive characters of family Agelenidae “Funnelweb spiders”
Diagnostic characters

Small to medium size araneomorph spiders (6-12 mm); three tarsal claws; ecribellate; entelegyne; eight eyes; posterior spinnerets two-segmented, long and slender,

with apical segment tapering towards tip; tarsi with trichobothria increasing in length towards tip; colulus paired (Jocqué & Dippenaar-Schoeman, 2006).

Descriptive characters

Colour: various shades of brown and grey, dorsum pattern consisting of a reddish brown folium and a series of pale spots; legs banded. Carapace: oval, attenuated in front, long and narrow in eye region; fovea longitudinal. Sternum: wide; heart-shaped. Eyes: eight; in two rows (4:4); equal in size. Chelicerae: promargin with three, retromargin with 2-8 teeth. Mouthparts: labium as wide as long; endites converging slightly. Legs: long with three claws; fairly slender and armed with numerous spines; tarsi with trichobothria increasing in length towards tip; trochanters I and II lacking notches; tarsi without scopula. Abdomen: narrow oval, tapering posteriorly; clothed in often feathery setae; dorsum usually with pattern. Spinnerets: anterior spinnerets widely separated; posterior spinnerets long and slender; two-segmented with apical segment narrowing towards tip; colulus paired or simple. Respiratory system: two booklungs; one pair of tubular tracheae close to spinnerets. Genitalia: entelegyne; epigyne variable; male palp with tibial apophysis; patella and femur sometimes with apophysis; embolus usually long; trichobothria absent from cymbium (Jocqué & Dippenaar-Schoeman, 2006).

Genus ***Lycosoides*** Lucas, 1846

Diagnosis:

The spiders of *Lycosoides* species have elongated spinnerets. The males have apophyses or tubercles on the palpal patella and a conductor complex with dorsal and ventral branches. The epigynes of females have a distinct atrium.

For diagnostic characters of *Lycosoides* species see Bosmans *et al.* (2022).

Abbreviations used: ACE = Arachnid Collection of Egypt, AL = abdomen length (without spinnerets), CL = carapace length, CWc = carapace width (cephalic region), CWt = carapace width (thoracic region), TL = total length (without spinnerets).

All measurements are in millimetres (mm).

Family **Agelenidae** C.L. Koch, 1837

Genus ***Lycosoides*** Lucas, 1846

Lycosoides coarctata (Dufour, 1831)

Figs. 1-10.

World Distribution: Algeria, Azerbaijan, Bulgaria, Croatia, Cyprus, Egypt, France (+ Corsica), Georgia, Greece (+ Crete), Italy (+ Sardinia, Sicily), Kosovo, Libya, Malta, Montenegro, Morocco, North Macedonia, Portugal, Spain (+ Balearic Islands), Tunisia, Turkey (Asia) (World Spider Catalog, 2025; Nentwig *et al.*, 2025).

Material examined. Jordan, 3♂♂, 2juv., Abu Nseir, north of Amman (32°03'17.4''N, 35°52'57.3''E elev. 1026 m): I. 1♂, 8 November 2011, 9:10 pm, inside house [ACE.2011.11.08.AR.001.JOR], II. 1♂, 10 November 2011, 10:30 pm, 1♂, running on the ground of the house's bathroom [ACE.2011.11.10.AR.001.JOR], III. 1♂, 17 November 2011, 10:50 am, found dead on the ground of the house [ACE.2011.11.17.AR. 001.JOR], 2 juveniles, November 2011, inside house.

For description of *Lycosoides coarctata* (Dufour, 1831) see Blauwe (1980) and Bosmans *et al.* (2022) and for its synonyms see World Spider Catalog (2025).

1 2 3 4

Figs. 1-4. *Lycosoides coarctata* (Dufour, 1831), from Amman. 1-3. Male. 4. Juvenile. 1, 4. habitus, dorsal view. 2. carapace, dorsal view. 3. elongated spinnerets, dorsal view.

Body measurements (Table 1).
Male habitus and carapace, dorsal view (Figs. 1-2). Elongated spinnerets of male (Fig. 3).

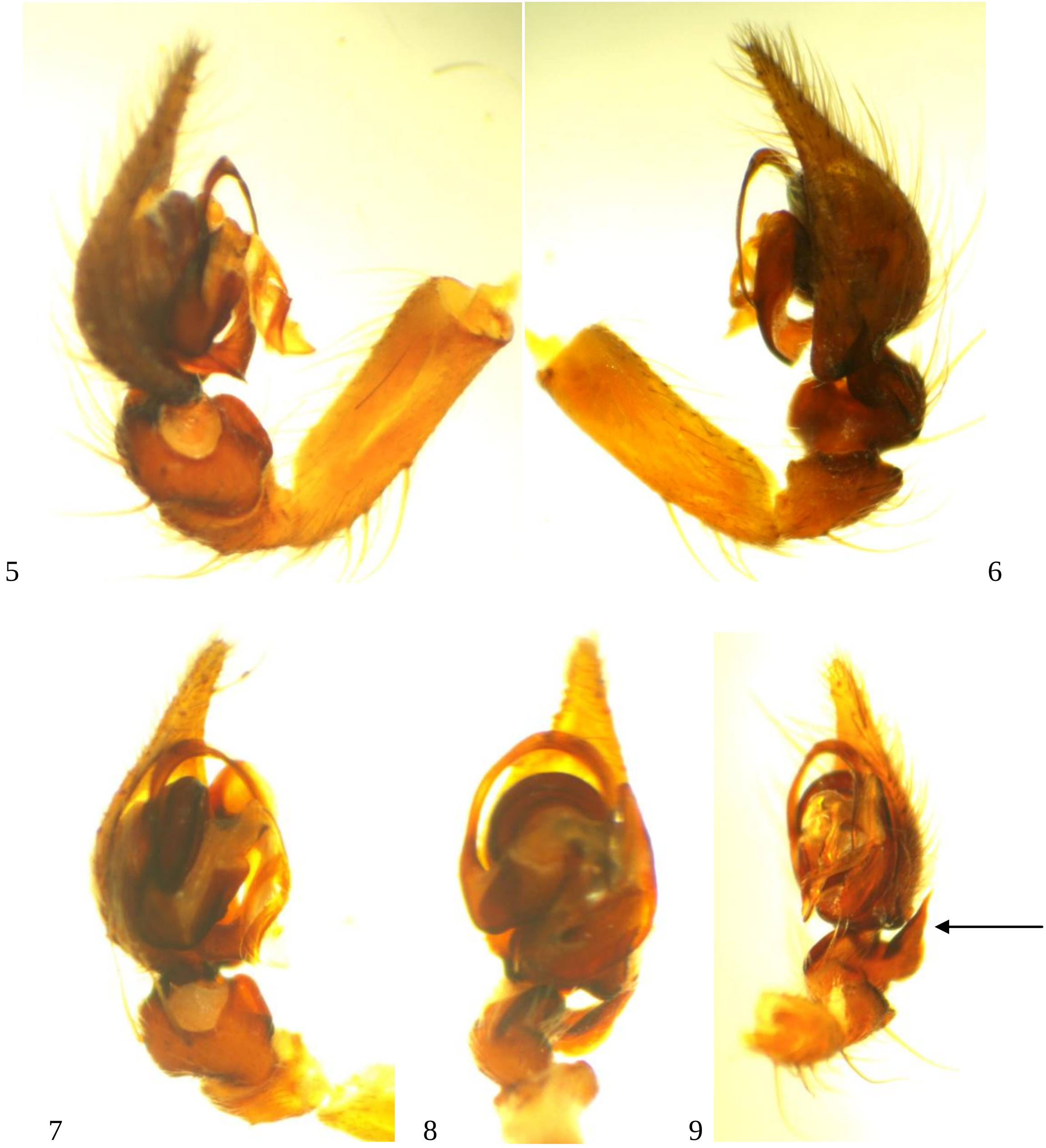
Table 1. Body measurements of three *Lycosoides coarctata* males.

	I.	II.	III.
CL	3.7	4.0	4.2
CWc	1.5	1.4	1.7
CWt	2.6	2.2	2.8
AL	2.5	2.4	3.5
TL	6.4	6.5	7.7

TL (without spinnerets) of two juveniles: 5.1, 5.4 (Fig. 4).

Male palp (Figs. 5-9): tibia with ventral crest and a large, curved dorso-retrolateral apophysis, with short, broad base and longer distal part pointed in retrolateral direction (Fig. 9) (Bosmans *et al*., 2022).

Epigyne (Fig. 10) [A specimen from Egypt]: see Bosmans *et al*. (2022).



Figs. 5-9. *Lycosoides coarctata* (Dufour, 1831), ♂ palp. 5. prolateral view. 6. retrolateral view. 7-9. ventral view (Arrow = tibial apophysis).

Fig. 10. *Lycosoides coarctata* (Dufour, 1831), ♀ (from Egypt), epigyne, ventral view.

House Spiders

House spiders are "those spider species that live with us in our apartments and houses. They are essentially our subtenants and not just passing through (although there are also such temporary visitors)" (Nentwig *et al.*, 2024). Agelenid spiders of the genera *Agelenopsis*, *Eratigena*, and *Tegenaria* are mentioned by Nentwig *et al.* (2024) as house spiders. *Lycosoides coarctata* and genus *Lycosoides* can be added to the house spiders of Jordan as "temporary visitors" coming from the small garden of the house.

Spider species of Jordan according to known records

The following list of Jordanian spiders comprises the list of 2020 (El-Hennawy, 2020) [13 Families, 24 genera, 28 species] updated by El-Hennawy (2023) in addition to other records published during 2024-2025 (*) to raise the recorded taxa to: 18 Families, 33 genera, 39 species.

Family **Agelenidae** C.L. Koch, 1837
Lycosoides coarctata (Dufour, 1831) * (Current record)

Family **Araneidae** Clerck, 1757
Argiope lobata (Pallas, 1772)

Family **Dysderidae** C.L. Koch, 1837
Dysdera lata Reuss, 1834

Family **Eresidae** C.L. Koch, 1845
Stegodyphus lineatus (Latreille, 1817)
Stegodyphus pacificus Pocock, 1900

Family **Gnaphosidae** Pocock, 1898
Haplodrassus mediterraneus Levy, 2004
Pterotricha dalmasi Fage, 1929
Zelotes scrutatus (O. Pickard-Cambridge, 1872)

Family Linyphiidae Blackwall, 1859
Alioranus pastoralis (O. Pickard-Cambridge, 1872)

Family **Liocranidae** Simon, 1897
Mesiotelus tenuissimus (L. Koch, 1866)

Family Lycosidae Sundevall, 1833
Evippa praelongipes (O. Pickard-Cambridge, 1870)
Lycosa piochardi Simon, 1876

Family Oecobiidae Blackwall, 1862
Oecobius cellariorum (Dugès, 1836)
Oecobius putus O. Pickard-Cambridge, 1876 * (El-Hennawy, 2025)
Uroctea hashemitorum Bosselaers, 1999

Family Oxyopidae Thorell, 1870
Oxyopes elifaz Levy, 2007

Family Pholcidae C.L. Koch, 1850

Artema nephilit Aharon, Huber & Gavish-Regev, 2017
Hoplopholcus cecconii Kulczyński, 1908

Family Salticidae Blackwall, 1841

Aelurillus gershomi Prószyński, 2000
Aelurillus nabataeus Prószyński, 2003
Cyrba algerina (Lucas, 1846)
Heliophanillus fulgens (O. Pickard-Cambridge, 1872)
Menemerus davidi Prószyński & Wesołowska, 1999
Mogrus logunovi Prószyński, 2000
Mogrus mirabilis Wesołowska & van Harten, 1994
Philaeus chrysops (Poda, 1761)
Synageles dalmaticus (Keyserling, 1863)

Family Scytodidae Blackwall, 1864

Scytodes kinzelbachi Wunderlich, 1995

Family **Sicariidae** Keyserling, 1880

Loxosceles rufescens (Dufour, 1820)

Family Sparassidae Bertkau, 1872

Cerbalus aravaensis Levy, 2007
Eusparassus walckenaeri (Audouin, 1825)
Micrommata formosa Pavesi, 1878

Family Theraphosidae Thorell, 1869

Chaetopelma olivaceum (C.L. Koch, 1841)

Family Theridiidae Sundevall, 1833

Latrodectus pallidus O. Pickard-Cambridge, 1872
Latrodectus tredecimguttatus (Rossi, 1790)
Steatoda paykulliana (Walckenaer, 1806) * (El-Hennawy, 2024)

Family Zodariidae Thorell, 1881

Pax meadei (O. Pickard-Cambridge, 1872)
Zodarion lutipes (O. Pickard-Cambridge, 1872)
Zodarion nitidum (Savigny, 1825)

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